

**Name:**

Derek Wong

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Pathology and Laboratory Medicine

Field of Research:

Brain Cancer and Molecular Biology

Quick summary of your research (200 words max):

Gliomas are the most commonly diagnosed form of brain cancer. I work on a specific subtype of glioma called Oligodendroglioma (ODG) which, unlike other gliomas, responds well to treatment and is associated with good patient outcome. Why are we studying ODG over more aggressive forms of glioma? ODG has a very unique mutational fingerprint and through studying its unique biology, researchers aim to recapitulate an “ODG-like” state in more aggressive forms of glioma. Therefore, making them easier to treat.

Almost all ODG tumours harbor mutations in IDH and co-deletions of whole chromosomal arms 1p and 19q. Cells typically have two copies of each gene, however, in ODG, due to the 1p19q co-deletion, all the genes that reside on these two chromosomes are left with only one copy (hemizygous). One gene that resides on chromosome 19q called CIC is mutated in up to 70%



of all ODG tumours, and is one of the main focuses of our lab. CIC is an extremely interesting gene because the mutational landscape resembles both a tumour suppressor and an oncogene. Genes frequently mutated in cancer typically only resemble either a tumour suppressor or an oncogene and not both. Such frequent CIC mutations in a hemizygous state, indicates that loss or altered function of this protein is integral to ODG biology.

Our lab investigates how CIC mutations affect many different aspects of a cell such as metabolome, proteome, and epigenome. My work utilises cell culture and proteomic techniques to look for CIC binding partners and to investigate their functional role and relationship with CIC to better understand how mutations in CIC may contribute to the unique biology of ODG.

Summary of what you would like to do with your mentees (400 words max):

Theoretical research projects do not have to be focused on ODG but will remain within the sphere of brain tumours. My goal is to introduce my mentees to the different technologies which can be used in a laboratory setting and how these technologies can be used to answer specific questions dependent on how an experiment is set up.

I do not have any specific project in mind which can range from basic cell/molecular biology, to clinical/translational research. In the past, I have let my mentees decide on their project as a group and in some instances, have introduced them into the lab to perform wet lab work.

Medicine



Citation #1:

⌘ <http://www.nejm.org/doi/full/10.1056/NEJMoa1402121#t=article>

Citation #2:

⌘ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3246739/>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/21376230>

Keyword #1:

Cancer

Keyword #2:

Cell Biology

Name:

Rashedul Islam

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Bioinformatics

Field of Research:

Cancer epigenomics

Quick summary of your research (200 words max):

The goal of my project is to characterize the epigenetic dysregulation in chronic lymphocytic leukemia (CLL) patients to better define the mechanisms driving transformation and potentially define epigenetic based prognostic and diagnostic markers. Epigenomic measurements from normal human subjects is used as controls in order to assess the CLL specific dysregulation.

Summary of what you would like to do with your mentees (400 words max):

A large number of genes are differentially expressed during maturation of human B-Cells in bone marrow and peripheral lymphoid organs (M. E. Hystad et al., J Immunol. 15, 179(6):3662-71 (2007), Y. Shen et al., BMC Immunol. 5, 20 (2004)). There is a prominent loss of DNA methylation (hypomethylation) with increasing maturity of normal B-cells (M. Kulis et al., Nat. Genet. 47, 746-756 (2015)). Open chromatin states increased in germinal center B-Cells compared to naïve B-Cells (J. Zhang et al.,

Blood. 123, 2988â€“2996 (2014)). Recent studies have revealed that distinct DNA methylation patterns exist in CLL subtypes (Kulis, M. et al. (2012) Nat. Genet. 44, 1236â€“1242; Queiros, A.C. et al. (2015) Leukemia 29, 598â€“605) and that methylation levels vary at different maturational stages of B cells (Oakes, C et al. (2016) Nat. Genet. 48, 253â€“264).

There are cancer datasets publicly available to study. These dataset includes the mutational profile of the cancer patients and their survival, gene expression, histone modification, DNA methylation etc. We will compare the genetic and epigenetic alterations of CLL with those of their normal B-cell counterparts to evaluate the link between normal B-cell differentiation and transformation to CLL.

Citation #1:

<https://www.sciencedirect.com/science/article/pii/S0301472X18302170>

Citation #2:

<https://www.sciencedirect.com/science/article/pii/S0888754312000262>

Citation #3:

nan

Keyword #1:

Bioinformatics

Keyword #2:

Cancer Epigenomics



Name:

Amanda Haage

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Cellular and Physiological Sciences

Field of Research:

Cell Migration

Quick summary of your research (200 words max):

Cells in multicellular organisms are arranged in highly complex three-dimensional patterns. To achieve this organization requires many cell movements during embryo development. I study how these movements are precisely spatially and temporally regulated in order to form a fully functioning adult organism. One of the main regulators of cell movement is the matrix that they move on, the extra-cellular matrix or ECM. How cells attach to the ECM controls when, where, and how fast they move. I study this process of cells stick to the ECM, called cell-ECM adhesion, by specifically looking at the adhesive proteins that extend from the cell and bind the ECM. I use a targeted structure/function approach where we disrupt the genetic structure in these proteins to study their functions. By learning what happens when I disrupt cell-ECM adhesion in mutant embryos I can further understand how these processes contribute to the normal development of an embryo.



Summary of what you would like to do with your mentees (400 words max):

As stated above, I study how cells move. Cells are supposed to move in processes like animal development and wound healing, but they also move when they are not supposed to, like in diseases such as cancer. Studying the basic biological process of how cells move in more depth furthers both the knowledge we have about how biological systems work in our universe and also gives us insights into human disease pathologies. I would like to stress with my mentees how basic research into answering fundamental questions about biology is essential for a better understanding of our world and for progressing disease research and treatments. I envision my REX group undertaking a project aimed at understanding how cells move in a variety of contexts. Last year my group completed a project entitled “Talin Autoinhibition in Hepatocellular Carcinoma: E1770A Mutation in Derived Cell Lines Affects Cancer Metastasis.” This project used a structure/function mutation in the cell-adhesion protein Talin within the context of cancer metastasis. Numerous other contexts could be explored, including other cancers, wound healing, and animal development. In addition, my REX group could further explore how to identify and create new mutant proteins and transgenic animal lines. Ultimately, as I have done in the past, I would like the interests of my REX group guide the research project. For timeline concerns, I would like to maintain a 1-2 hour weekly meeting with my group throughout the program, where everyone contributes equally to the finished product.

Citation #1:

Medicine



<https://www.ncbi.nlm.nih.gov/pubmed/27739043>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/26201843>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/20301223>

Keyword #1:

Cell Biology

Keyword #2:

Cancer

Name:

Jessica Lovnicki

Degree or Position:

Master's

Institution:

UBC

Department:

Urological Sciences

Field of Research:

Prostate Cancer

Quick summary of your research (200 words max):

Androgen deprivation therapy, also known as castration therapy, is used to effectively treat patients with late-stage prostate cancer. ADT works by depriving the tumors of androgen, which is their fuel to grow and survive. However, to survive these treatments, tumor cells find a way to grow and survive without androgens. One of the ways to survive is by becoming neuroendocrine tumors (NET). Unfortunately NET have a very poor prognosis in prostate cancer patients and are aggressive and lethal because of their ability to grow and survive without androgen. Consequently, NET are estimated to affect 25% of late-stage prostate cancer patients and are predicted in becoming more prevalent among patients that have undergone ADT, and their unresponsiveness towards any available therapy is becoming a clinical problem. Although it is unknown how ADT causes NET to form, we are working towards finding unique genes highly abundant in patient NET. Identifying key genes and understanding their functions in tumor

progression will elucidate how NET develop. This is important for creating new and improved ADT regimes that will be effective in preventing the formation of NET and improving prognosis of prostate cancer patients.

Summary of what you would like to do with your mentees (400 words max):

I think that it would be interesting to take already published data and look at gene expression in late stage prostate cancer and NET, and compare these to each other. We can use RNA-seq data and microarray data from various cohort studies to see what genes are upregulated and downregulated.

From there, I would want to compare these results to small cell lung cancer (SCLC) studies, as SCLC and NET progress in similar ways. Based on this information, we can predict genes that may play an important role in NET progression.

This theoretical project would involve working with wet bench techniques, such as Western blots, q-PCR, immunohistochemistry (IHC), creating plasmids, flow cytometry, and cellular proliferation and apoptosis assays. Dry bench techniques that would be used would include the ability to analyze microarray data as well as IHC images.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/29666783>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/29569310>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/25349195>

Keyword #1:

Graduate and Postdoctoral Studies

Cancer

Keyword #2:

Biology



Name:

Mohammadreza Rostam

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Mechanical Department

Field of Research:

Dynamics and Control

Quick summary of your research (200 words max):

I am a Ph.D. student in the "control engineering laboratory". I am working on designing an advanced predictive controller (MPC) for solar thermal systems using machine learning techniques.

We are surrounded by control systems. Every system, little or big, needs a control system to operate in the desired manner. Quadrotors, airplanes, cruise controls, and Mars rovers are just a few examples. In my research, in particular, I am improving the performance of a domestic solar thermal system by considering forecast information such that hot water is always available for the user(s) regardless of weather and ambient temperature.

Summary of what you would like to do with your mentees (400 words max):

I am open to projects related to control. There are many exciting engineering problems out there. Mentees can pick an impressive system, and define a control problem for it. I also would encourage anyone with a keen

interest in complex systems (e.g., human body) to bring their research ideas to me, even though my personal expertise is in the dynamic and thermal systems.

Citation #1:

<https://arxiv.org/ftp/arxiv/papers/1602/1602.02622.pdf>

Citation #2:

<https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7836354>

Citation #3:

nan

Keyword #1:

Control system

Keyword #2:

Modeling



Name:

Delbert Chiu-Fai Yip

Degree or Position:

Master's

Institution:

UBC

Department:

Cellular and Physiological Sciences

Field of Research:

structural and functional characterization of pacemaker proteins

Quick summary of your research (200 words max):

Ion channels are proteins that act as microscopic conduits for electrical charge in the cells of nearly all animals, and which underlie a variety of physiological functions, including cardiovascular, digestive, endocrine, and neuronal processes. I study a specific family of ion channels known as hyperpolarization-activated cyclic nucleotide-gated (HCN) channels that serve life-essential roles in generating autorhythmicity in the heart and brain. By advancing our theoretical understanding of HCN channel function, I hope to contribute to therapeutic development for conditions that implicate altered HCN channel function, such as cardiac arrhythmia and epilepsy. Currently, I am interested in modelling two notable cases of altered HCN channel function. Firstly, a mutant that exhibits greatly slowed deactivation, which would physiologically translate to, for instance, abnormally high levels of pacemaking activity in the heart. The second case is that of cesium-induced partial antagonism of HCN channels,



the mechanism of which is suggested to belie commonly used modelling frameworks. Results from these two projects will have both clinical and scientific implications by elucidating aspects of HCN channel gating, ion selectivity, and pharmacological regulation.

Summary of what you would like to do with your mentees (400 words max):

With my mentees, I will be open to exploring various topics in biology, with a focus on the mathematical modelling of ion channels important for biological rhythmicity. Possible projects are abound, as biological rhythmicity underlies a variety of processes, including the circadian cycle, digestion, locomotion, respiration, and sleep. Unlike most REX projects in the life sciences, prospective mentees can conduct an original research project with clearly defined results. While all mentees will learn and apply powerful computational methods such as mathematical modelling and scientific programming, students with a strong background in these subjects can still be presented a challenging project. For instance, beginners may attempt to model events in a simplistic manner or on a lower scale of biological organization, as in a finite state Markov model for the kinetics of a ligand-gated ion channel, whereas a more advanced project could entail investigation at the cellular or tissue levels. However, prospective mentees wishing to explore other areas of biology are also welcome to do so. First, I expect mentees to decide on a general area of interest. Subsequently, the students will spend two weeks acquiring a background on the basic mathematical and scientific principles required for their modelling. By the end of this period, my mentees and I will



formulate a specific research direction, after which up to two weeks will be spent developing a suitable theoretical framework for the model. The latter half of our project will be spent, in order: parameterization of the model, simulations of the model, discussion of results, writing, and finally, presentation. Importantly, I will offer guidance mainly in the first half of the project, while I expect to provide constant supervision but minimal intervention in the latter half, which will be the bulk of the work. In addition to acquiring the mathematical and scientific background of their project, my mentees can also expect to gain familiarity in scientific programming with XPPAUT, Python, or Matlab, which will be used as required. Overall, I hope to leverage REX to offer my students a productive, challenging, independent, and original research experience not often available at this level in the life sciences.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/11382803>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/18953682>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2154356/>

Keyword #1:

modelling

Keyword #2:

physiology

Pharmaceutical Sciences



Name:

Shahrzad Salmasi

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Pharmaceutical Sciences

Field of Research:

Epidemiology, Clinical research

Quick summary of your research (200 words max):

I am a pharmacist. I completed my MSc studies at UBC and am currently studying PhD at UBC faculty of Pharmaceutical Sciences. The umbrella term for my research is called "outcomes Research" which involves any research that translates into better health outcomes for patients. This includes epidemiological, clinical, health-economics and pharmacy practice research. The data for this type of research usually comes directly from patients or from administrative databases. The analysis is almost entirely done on computer and there is no laboratory work involved. The methodologies used in outcomes research can be applied to any therapeutic area. The focus of my research is on Cardiovascular medications, more specifically, anticoagulants. Anticoagulants are commonly referred to as "blood thinners". They reduce the ability of the blood to clot and hence prevent stroke, heart attack or deep vein thrombosis in at risk patients. My research aims to improve AF patients' adherence to their these

medications. I try to understand determinants of poor adherence to anticoagulants and investigate ways in which adherence to these medications can be improved (eg: patient education).

Summary of what you would like to do with your mentees (400 words max):

Research has identified patients' lack of knowledge as a key barrier to therapy uptake and adherence. Many studies have assessed patients' knowledge of their anticoagulant medications using questionnaires, surveys or interviews. However, to date, no systematic review has summarized these findings to identify patients' knowledge gaps. During my MSc studies, I conducted a systematic review to summarize the evidence on atrial fibrillation patients' knowledge of anticoagulants (currently under review for publication). This systematic review was however limited as it only focused on Atrial Fibrillation patients. Anticoagulants are taken by a wide range of patients and not just those suffering from Atrial Fibrillation. With the help of my mentees I plan to conduct a systematic review that summarizes the available evidence on patients' knowledge of their anticoagulant medications. This systematic review will include evidence from all patients taking anticoagulants and not just those suffering from atrial fibrillation. As a pharmacist and researcher, I strongly believe that such research is needed to inform us about patients' current level of understanding of their medications, identifying areas in need of improvement and enhancing current patient education programs and initiatives.



Systematic reviews allow students to acquire invaluable skills on conducting proper, systematic search of the literature, and bringing together the available evidence to answer research questions. Such skills are foundational in any type of research that students may undertake in the future. Systematic reviews also do not require ethical approval or funding, making them logistically easier to conduct compared to research involving patients. The project I have in mind can be conducted entirely on the computer, granting mentees flexibility around where and when they would like to work. I will meet frequently with my mentees to guide every step of the research.

The first step would involve some reading on anticoagulants (there are 4 of them), their use and what patients need to know about them. After students are familiar with the topic we can start the literature review to find the current studies that have assessed patients' knowledge of their anticoagulant medications (I am anticipating around 30 studies). This will be followed by data extraction (extracting information that is important in answering our research question from each study) and then bringing the evidence together to identify knowledge gaps. The findings of this systematic review will generate clinically important knowledge that can potentially guide the content of future patient education programs.

Citation #1:

<https://academic.oup.com/jac/article/71/1/27/2363966>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/26462697>



Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/21348546>

Keyword #1:

systematic review, Cardiovascular research, anticoagulant

Keyword #2:

Patient education, Patient knowledge gaps



Name:

Faisal Khosa

Degree or Position:

MD, MBA

Institution:

UBC

Department:

Radiology

Field of Research:

Disparities research (racial, gender, financial etc)

Quick summary of your research (200 words max):

My research focus is on study of influences for disparity in which I am mentoring students across Canada. We have successfully tested our hypothesis and methodology with projects, which formed the basis of manuscripts accepted by high impact, prestigious peer reviewed journals.

Summary of what you would like to do with your mentees (400 words max):

literature search & data collection

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/29942717>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/30063373>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/29330932>

Keyword #1:

Social Sciences research

Keyword #2:

Medicine



Disparities (gender, racial & financial)

**Name:**

Mark Trinder

Degree or Position:

MD/PhD student

Institution:

UBC

Department:

MD/PhD Program

Field of Research:

Lipid genetics in atherosclerosis and infectious disease.

Quick summary of your research (200 words max):

I am an MD/PhD student working with Drs. Liam Brunham, John Boyd, Keith Walley, and Jim Russell at the Centre for Heart and Lung Innovation. The fundamental questions I seek to answer are: 1) "why do some patients die or suffer major disability from acute illnesses, while others make remarkable recoveries?", and 2) "what can we do to help the patients at high risk of poor clinical outcomes?". Our data has led us to investigate lipids and genetics as key pieces to this complex puzzle.

Infectious and cardiovascular diseases are major causes of hospitalization, long-lasting disability, and acute death. We have found a surprising connection between lipid components in the blood, known as lipoproteins, and the development of these unique diseases (e.g. sepsis, heart attacks, strokes). Notably, a patient's blood lipids are strongly determined by genetics. Our ongoing work uses translational lipid



genomics: 1) to diagnose or determine genetic variations that predispose patients to bad outcomes, 2) guide treatment strategies, and 3) identify novel treatment strategies for cardiovascular and infectious disease.

Summary of what you would like to do with your mentees (400 words max):

The intersection of clinical medicine and genomics has a wealth of opportunities for interested students to pursue. All students will need is a biological question of interest and a computer. Students may also have opportunities to follow-up their computational findings with laboratory-based experiments, but this level of commitment is not necessary. Importantly, I am confident that the skills developed from studying genomics can lead to diverse number of careers in health care, academia, and computer science.

Students with an interest in understanding the relationships between molecular biology and disease may wish to use several public and genomic resources, such as the Global Biobank Engine (<https://biobankengine.stanford.edu/>), Genotype-Tissue Expression (GTEx) project (<https://www.gtexportal.org/home/>), Genome Wide Association Study Catalog (<https://www.ebi.ac.uk/gwas/>) and numerous other to explore their hypotheses. These resources are free and can be accessed remotely. Complex computer coding is in no means required. However, plenty of opportunities are also available for students that are more drawn to computer coding. Computational savvy individuals are always needed to collaborate with biologists to develop code for more efficient and affective exploration



and analysis of large data sets.

This experience would be ideal for students hoping to learn more about: 1) genetic contribution to disease/epidemiology, 2) personalized clinical medicine, 3) analyzing “big data”, or 4) developing computer coding skills. I look forward to helping students brainstorm research question(s) and plan their experimental methodology for their topics of interest (based on their literature review). As an academic editor for the UBC Medical Journal, I would also encourage you to take the numerous opportunities to present your work at local conferences and submit the final products for publication.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/25320235>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/18354102>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/26255038>

Keyword #1:

genetics

Keyword #2:

inflammation



Name:

Bas Vriens

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Earth, Ocean, and Atmospheric Sciences

Field of Research:

Environmental Chemistry

Quick summary of your research (200 words max):

Hi! My name is Bas Vriens and as an environmental chemist, I study the behavior and fate of harmful contaminants in the (surface) environment. As you will read in the news, or perhaps know from your own experience, human activities often introduce undesirable levels of potentially toxic substances into the environment and create public health risks. Examples include the (over-)application of pesticides and fertilizers on agricultural soils, leaking sewers or landfills, accidents at industrial sites, etc. etc. As environmental chemists, we try to describe the transport and transformation of these contaminants in soils, surface waters (rivers, lakes), groundwater or the atmosphere. Our goal is to ultimately be able to predict the behavior and fate of these contaminants in the environment, and thereby minimize the health risks associated with, for instance, drinking water contamination or crop uptake of toxic heavy metals. This requires us to combine concepts from a broad variety of



scientific fields, including geochemistry, hydrology, microbiology, and civil engineering.

Summary of what you would like to do with your mentees (400 words max):

Currently, I work on various projects in the context of mine waste management. The displacement of rock through human extraction of ore minerals has become one of the largest geomorphic factors on Earth and the environmental impacts of mining are correspondingly large. The weathering and drainage of mine waste rock can produce metal-laden, oftentimes acidic waters (â€œacid rock drainageâ€•). With increasing demand and exploitation of lower-grade deposits, the control and mitigation of waste streams is a big and expensive environmental challenge for mines worldwide.

We have been working with the Antamina mine in Peru (one of the worldâ€™s largest copper mines) to study the processes that control the weathering of their waste rock. In order to ultimately reduce its environmental footprint, it is crucial that the mine can forecast the volume, timing, and chemical characteristics of its waste rock drainage. This is not an easy task, because the generated waste rock and the local weathering conditions are highly variable, and because the chemical reactions and physical transport processes (e.g., the infiltration of rain) are intricately coupled. In addition, we cannot simply extrapolate these geochemical and physical processes from small-scale laboratory experiments to real-world scenarios (i.e. hundreds of meter tall waste rock piles).



We have been collecting a massive amount of data at Antamina mine for the last 12 years, ranging from rain records and aqueous drainage chemistry data, to microbial community analyses and pore gas measurements in the waste rock piles. In the REX program, I would like to show you how we, as environmental chemists, can approach these complex systems by creating process-based conceptual models, and by simplifying the complicated web of physico-chemical interactions through realistic assumptions and boundary conditions. Ideally, I would like to work on one or two specific industry-driven engineering questions from the mine, to illustrate how complex (and costly!) environmental management challenges can be addressed by relatively simple data analyses and engineering calculations.

Citation #1:

<http://www.mdpi.com/2075-163X/5/1/82/pdf>

Citation #2:

<https://www.sciencedirect.com/science/article/pii/S0883292714001474>

Citation #3:

nan

Keyword #1:

environment

Keyword #2:

geochemistry



Name:

David Wakeham

Degree or Position:

Ph.D.

Institution:

UBC

Department:

School of Physics and Astronomy

Field of Research:

String theory

Quick summary of your research (200 words max):

Hi! I'm a PhD student in the string theory group at UBC. I study quantum gravity; loosely speaking, this is the theory needed to describe what happens when you throw Schrödinger's cat into a black hole. Although quantum gravity is poorly understood in general, in one setting we have made impressive progress: quantum gravity in a box.

Suppose I give you a box with a little universe inside. The little universe is governed by gravity, a geometric theory where objects can stretch, curve and collapse into black holes. 20 years ago, physicists discovered a miracle: gravity inside the box is encoded in quantum physics on the surface. This is a bit like a hologram, where we can "see" a three-dimensional image emerging from a two-dimensional surface, so the relation between inside and outside is called the "holographic correspondence".



Let's return to the unethical experiment proposed above: dropping Schrödinger's cat into a black hole. Do we understand what happens in the simplest quantum gravity setting, when the black hole is inside the box? Well, not exactly, but a remarkable simplification occurs. Using the holographic correspondence, the black hole can be understood as a special type of quantum computer, and dropping the cat becomes an information processing task. So we can study quantum gravity by learning more about quantum computers!

Summary of what you would like to do with your mentees (400 words max):

Although quantum gravity is a hard subject, the universe-in-a-box has led to new ways of thinking which are powerful, conceptually deep, and relatively accessible to newcomers. This means REX mentees will not be obliged to learn any string theory (though they are not discouraged from doing so). I will mention two such approaches, though I am open to working on other projects involving gravity, quantum mechanics, or related mathematics/physics.

The first approach uses something called tensor networks. These are a type of graphical "quantum lego": simple modular components that can be stuck together to describe quantum computers, interacting systems of quantum particles, and even toy models of quantum gravity. Tensor networks provide a particularly effective means of describing quantum entanglement, which Einstein famously called "spooky action at a distance", and which recent



developments suggest is at the heart of how spacetime emerges from quantum mechanics.

One project idea: model a black hole with a tensor network, and see what happens when you drop Schrödinger's cat in. There is a connection between the interior geometry of the black hole and quantum teleportation, and it may be possible to make this connection more explicit with the network model.

The second approach uses "bit threads". These are like tin can telephones, with the can at either end clamped to the surface of the universe-in-a-box, and the thread in between free to wiggle about gravitationally. Like a tin can telephone, bit threads transport information between the endpoints, but in this case the information is quantum entanglement.

One idea is to add more interesting circuit components (see tensor networks) to a bit thread. We can think of this as upgrading the tin can telephone into a computer! Another idea is to think "outside the box" and generalise bit threads to other quantum gravity settings.

Citation #1:

<https://arxiv.org/abs/1807.08790>

Citation #2:

<https://arxiv.org/abs/1603.03039>

Science



Citation #3:

<https://arxiv.org/abs/1604.00354>

Keyword #1:

Physics

Keyword #2:

Holography



Name:

Jonathan Simkin

Degree or Position:

Ph.D.

Institution:

UBC

Department:

School of Population and Public Health

Field of Research:

Cancer Prevention and Control

Quick summary of your research (200 words max):

While Canadians have made several strides in the fight against cancer, improvements have not been distributed equally across the population. Further, cancer is an emerging public health priority in Canada's North and among Indigenous Peoples in Canada yet, information to address this priority is limited. This gap is a barrier to evidence-based decision making. My research focuses examining cancer among Northern, Rural and Remote Canadians, and Indigenous Peoples in Canada with a culturally-safe and collaborative approach to understand geographic patterns, identify potential etiologies and inform cancer control and prevention strategies.

My vision is to reverse the evidence-deficit, eliminate disparities, and create a more inclusive and forward-looking evidence-based system for all Canadians. I work directly with key stakeholders, such regional medical health officers and policy leads, Indigenous organizations and community



leaders, to examine Canadian population health data (e.g. Canadian cancer registries, hospital administrative data and Statistics Canada survey data), and identify and support cancer prevention and control strategies.

Summary of what you would like to do with your mentees (400 words max):

I am very keen on supporting students who are interested in studying population and public health. As a PhD Student in Population and Public Health (Faculty of Medicine), previous alumni of the Master of Public Health program at UBC, and current Cancer Epidemiologist at Health and Social Services, Government of Yukon, I have both academic and professional experience working with Canadian population health data, using statistical software, and report/manuscript writing for those who might be interested in publishing their findings or presenting their findings at conferences.

I encourage students to use publicly available Canadian data e.g. the Canadian Community Health Survey. This survey is conducted by Statistics Canada every year, with the goal of collecting health and social information on a representative sample of the Canadian population. It is a great resource used by researchers and government health officials and supports a wide-range of questions – a few ideas: Is there a relationship between those who bike/cycle/exercise and mental health? Do people report differences in access to care based on rural/urban residence? Does cancer screening in Canada differ by level of income? These are just a few examples but there are loads of questions that can be



answered with publicly available data and can be used to support policy locally, provincially, or nationally. I am very open on listening to your interests, passions, and ideas. I am well-positioned to support students in developing research questions, conducting literature reviews, accessing publicly data, and analyzing and reporting their findings.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5497549/>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4399612/>

Citation #3:

nan

Keyword #1:

Population Health

Keyword #2:

Cancer Prevention and Control



Name:

Rachel Soo

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Linguistics

Field of Research:

Speech perception, bilingualism

Quick summary of your research (200 words max):

Hi folks! I am a PhD student in the Department of Linguistics studying Cantonese heritage speakers and their perception and production of Cantonese sounds. My research combines insights and methods from linguistics and psychology to investigate issues of language dominance in this group of bilinguals. More broadly, I am interested in second language learners of English from different linguistic backgrounds and how these speakers maintain the sound categories in their first language, while acquiring sound categories in their second language. In the past, I have worked with languages such as Cantonese, English, Mandarin and Tagalog, but I am open to investigating other languages as well!

Summary of what you would like to do with your mentees (400 words max):

What's most important to me is that my mentees research a topic that interests them. I find that the most successful projects are those that probe a topic that is personal to the researcher. As such, I am open to



investigating any language or population that my mentee feels passionately about. Beyond this, I'd like to tackle a novel research question with my mentee. Since the field of linguistics is still young and full of promise, there is every opportunity to make a significant and meaningful contribution. Finally, it is my goal to transfer skills necessary for an experimental project, including synthesis of primary literature, stimulus design and manipulation in Praat, experiment implementation in PsychoPy, data analysis using a command-line software R, and data presentation to a scholarly audience.

Citation #1:

http://www.linguistics.berkeley.edu/bls/previous_proceedings/bls43_2.pdf#page=55

Citation #2:

https://www.yoonjungkang.com/uploads/1/1/6/2/11625099/07kang_2016_hlj.pdf

Citation #3:

nan

Keyword #1:

Heritage speakers

Keyword #2:

Psycholinguistics

Education



Name:

Claudius Soodeen

Degree or Position:

EdD

Institution:

UBC

Department:

EDST

Field of Research:

Higher Education - Internationalization; Leadership; Adult Education

Quick summary of your research (200 words max):

My doctoral research took the form of a case study in which I used qualitative interviews to investigate college leaders' understandings and implementation of internationalization. My master's research used similar methods to look at a new model for internationalizing curriculum in higher education. However, I am also interested in how adults learn and how higher education institutions (universities and colleges) can become more equitable places for employees and students. Embedded in all of this is the necessary look at inclusive and intercultural education.

Summary of what you would like to do with your mentees (400 words max):

From my teaching experience, coming up with concrete research topics, research questions and thesis statements can be difficult, so I would be willing to help them work through this process, regardless of their topic. However, it would be interesting to look at topics in the area of learner preparedness & expectations for/of post-secondary studies, academic

Education



integrity, use of technology, interdisciplinarity, international student concerns etc The timeline depends on what we're going to work on but could span more than one term.

Citation #1:

My dissertation: <http://hdl.handle.net/2429/66213>

Citation #2:

Master's project -
http://dtp.r.lib.athabasca.ca/action/download.php?filename=mais/claudius_sodeen_project.pdf

Citation #3:

The Just Learning Society -
<http://www.learningandwork.org.uk.gridhosted.co.uk/wp-content/uploads/2017/01/DesigningTheJustLearningSociety.pdf>

Keyword #1:

Adult Education

Keyword #2:

Leadership

Education



Name:

Shahid A. Hassan

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Language and Literacy Education

Field of Research:

Language education, assessment, Academic English, teacher development

Quick summary of your research (200 words max):

In the field of language education, I research language practitioners' assessment literacy (or competence to assess the language learning reliably and effectively). I use mixed methods approach to research, and I have also worked on qualitative and quantitative research projects. I have been a recipient of various competitive awards to support my research.

Assessment practices and policies are a key issue, and there is a dearth of contextualized research on the role of language practitioners in developing, designing, and administering assessment. In the Canadian context, My research aims to inform and analyze this issue and to make a contribution to the field of language education at post-secondary institutions against the backdrop of the increasingly diverse educational institutions in the Lower Mainland region.

Summary of what you would like to do with your mentees (400 words max):

Education



I would support my mentees in response to their academic and research needs. I could facilitate their research in planning, designing, implementing, and analyzing stages of their projects. Every research project has its own unique challenges for undergraduate students.

I have been a classroom practitioner, academic researcher, and teacher development facilitator in higher education settings for over a decade and a half in many countries across the world. I currently teach academic language courses and practice as an ESOL examiner. I have also been involved in many editorial projects and student service activities at UBC.

I am passionate about peer support, reflective teaching, and learner-centered instruction. I believe teaching, learning, and research are immensely collaborative and socially-oriented activities as opposed to being practiced in isolation. And, we all benefit irrespective of our roles.

Citation #1:

https://www.academia.edu/9127563/Writing_or_organizing_a_research_paper

Citation #2:

<https://link.springer.com/article/10.1007%2Fs11092-015-9233-6>

Citation #3:

https://www.researchgate.net/publication/303348210_English_for_Academic_Purposes

Keyword #1:

Education

Education



Keyword #2:

Language Education, Literacy



Name:

Ashley Davidson

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Earth, Ocean & Atmospheric Sciences

Field of Research:

Aqueous Geochemistry

Quick summary of your research (200 words max):

The Earth's atmosphere has not always been oxygenated as it is today. Determining when oxygen first appeared and how it evolved over the past 4 billion years is of great interest to researchers across various fields from evolutionary biology to climate modelers. Chromium, a useful metal responsible for stainless steel and chrome plating, has four stable isotopes, the distribution of which can be altered by different chemical processes and may record when oxygen first entered the atmosphere. My project is to determine if chromium isotopes can be used this way, if there are any limits to their use, and what else we might be able to use this isotope system for.

Summary of what you would like to do with your mentees (400 words max):

I have a few ideas related to chromium isotopes and other transition metal stable isotope systems and their potential uses, but I encourage students to come up with their own ideas – this is your project and I want you to



be excited about it! Outside of metal stable isotopes, I also have interests in inorganic chemistry, analytical chemistry, heavy metal remediation and oceanography and would be open to research questions involving any of these topics. Depending on students' backgrounds and interests, use of data and/or lab work may be possible, as would shadowing of advance analytical techniques (for example ICP-MS).

Citation #1:

<https://www.nature.com/articles/nature12426>

Citation #2:

<https://www.annualreviews.org/doi/10.1146/annurev.earth.34.031405.125029>

Citation #3:

nan

Keyword #1:

Geochemistry

Keyword #2:

Trace metals



Name:

Blair Hardman

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Microbiology and Immunology

Field of Research:

Bio-geography of immune responses

Quick summary of your research (200 words max):

My work focuses on identifying both the broad signals and direct cell to cell communication that direct antiviral T cell responses against viral infections in the intestine. Using microscopy and flow cytometry I have been characterizing the differing interactions that arise due to acute and chronic viral infections.

Summary of what you would like to do with your mentees (400 words max):

Ideally our project would be focused on infection of some kind, particularly interesting to me are parasitic infections and chronic viral infections. These pathogens are experts at immune suppression and modulation thus providing ample opportunities to study both the processes used by the immune system to defend against pathogens and how chronic pathogens disrupt these processes. Not only do these studies provide attractive basic research avenues, but the methods used to modulate immune systems are increasingly being seen as attractive avenues of drug



discovery.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4374592/>

Citation #2:

<https://www.annualreviews.org/doi/pdf/10.1146/annurev-virology-100114-055226>

Citation #3:

<https://www.sciencedirect.com/science/article/pii/S1198743X16301215>

Keyword #1:

Immunology

Keyword #2:

Chronic infection



Name:

Jane Desrochers

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Orthopedics

Field of Research:

Biomedical Mechanics and Imaging

Quick summary of your research (200 words max):

Osteoarthritis (OA) is a debilitating condition that leads to painful, stiff and swollen joints. Your risk of developing knee OA doubles following a major injury and all the factors that determine that risk are not completely understood. Surgeries to repair damaged tissues such as the ACL and meniscus offer certain benefits, but their success is not universal. My research endeavors to better understand why.

Summary of what you would like to do with your mentees (400 words max):

My intention is not to give REx trainees a project; I have nothing specific in mind. I see my role as a mentor, but the original idea "the seed of the research question" needs to come from the trainees. My post-graduate research has focused on studies at the intersection of microscale imaging and mechanics in skeletal tissue. Anything in that vast arena is fair game.

I invite budding researchers from all departments with an interest in

Graduate and Postdoctoral Studies

orthopedic biomechanics, but preference will be given to applicants from biomedical engineering.

I have a wealth of experience using some really cool imaging technologies and I am just beginning to learn lots of new ones. In my lab, we use some leading edge biomechanical testing and clinical imaging equipment including an open MRI and we're always recruiting for healthy volunteers so trainees will probably have the opportunity to participate in studies using open MRI.

<https://www.youtube.com/watch?v=j5Ang1M2ukQ>

I have a very strong technical writing background and can offer a ton of advice on how to effectively craft abstracts and papers, posters and talks, and especially grants and scholarships.

Please note that my office and lab are located at the Centre for Hip Health and Mobility on the VGH campus; not at UBC.

Citation #1:

<http://www.sciencedirect.com/science/article/pii/S0021929010004422>

Citation #2:

<http://www.sciencedirect.com/science/article/pii/S0021929010002083>

Citation #3:

<http://www.sciencedirect.com/science/article/pii/S1751616113001070>

Keyword #1:

biomechanics

Keyword #2:

medical imaging



Name:

Nur Afiqah Mohd Salleh

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Interdisciplinary Studies Graduate Program

Field of Research:

HIV in people who use illicit drugs

Quick summary of your research (200 words max):

My field of interest is looking at HIV clinical engagement among people living with HIV who use illicit drugs, particularly social and structural barriers that facilitate or hamper adherence to treatment. I am also interested in integrated services that combine both health and social services that would improve health outcomes among this population.

Summary of what you would like to do with your mentees (400 words max):

I would like to guide them into conducting a systematic review, which is a rigorous scientific process but is often undervalued. I feel that it is important to look at what kind of evidence is out there in health science and what the gaps are that need to be filled in. The research topic is entirely up to the mentees, depending on their interest. In addition to this, I am open to other options. We could potentially look at doing simple analysis using existing data. I will be attaching some of the articles from our research centre that might spark some interest.



Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/30066113>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/22333747>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/29521670>

Keyword #1:

HIV

Keyword #2:

illicit drug use



Name:

Yuliya Kuzmenko

Degree or Position:

Ph.D.

Institution:

UBC

Department:

EOAS

Field of Research:

biological oceanography

Quick summary of your research (200 words max):

I have a doctorate degree in fisheries biology and currently working on my second PhD in biological oceanography. My research is focused on the Fraser river salmon growth during early marine period and its implications for survival.

Summary of what you would like to do with your mentees (400 words max):

My future mentees can choose from several available topics related to extraction of life history data from fish otoliths (small calcified structures in fish ears) and building predictive models on changes in otoliths under the influence of different intrinsic and extrinsic factors.

In simpler words they can learn about reconstruction of life conditions and fish life events with data extracted from fish body parts - "living archives". There is also an opportunity to learn about statistical methods working with "R studio".

Citation #1:



Campana, S. E., & Neilson, J. D. (1985). Microstructure of Fish Otoliths. Canadian Journal of Fisheries and Aquatic Sciences, 42(5), 1014â€"1032.

Citation #2:

Disspain, M. C. F., Ulm, S., & Gillanders, B. M. (2016). Otoliths in archaeology: Methods, applications and future prospects. Journal of Archaeological Science: Reports, 6, 623â€"632. <https://doi.org/10.1016/j.jasrep.2015.05.012>

Citation #3:

Sockeye Salmon (*Oncorhynchus nerka*) - Population Biology and Future Management [Special issue].

Keyword #1:

Salmon

Keyword #2:

Oceanography



Name:

Natasha Orr

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Obstetrics and Gynecology

Field of Research:

Endometriosis; Sexual Pain; Central Nervous System

Quick summary of your research (200 words max):

Endometriosis affects 10% of women, and is defined as the presence of endometrial cells growing abnormally outside the uterus. Endometriosis is associated with deep dyspareunia (pelvic pain with deep penetration during sexual intercourse), which has significant negative impacts on sexual function. Standard treatments for endometriosis include hormonal and surgical therapies; however, some patients with deep dyspareunia do not respond to these treatments and up to 40% of patients have recurrence of painful symptoms within 3 years post-operatively. Literature is limited in its understanding of the cause of deep dyspareunia in endometriosis.

We have previously found that bladder and/or pelvic floor tenderness was significantly associated with a higher severity of deep dyspareunia in women with endometriosis. We now want to determine what the cause of the tender bladder and/or pelvic floor is- which we believe to be due to central sensitization (amplification of pain signaling). We are currently



measuring central sensitization with a pain-pressure threshold test to determine its association with bladder and/or pelvic floor tenderness as well as its role in the severity of deep dyspareunia in women with endometriosis.

Summary of what you would like to do with your mentees (400 words max):

When creating your research project, we can focus on key topics similar to my research such as: endometriosis, central sensitization, female sexual health. Potential research projects could be an imaging study (i.e. MRI) looking at brain differences in endometriosis with and without deep dyspareunia or looking at mutations in endometriosis lesions that may be playing a role in the pain. However, I am more than willing to help you create a project in a field different than mine! My previous REX mentees created a project on post-stroke depression which was a great opportunity to learn about a new field. Feel free to contact me if you have any questions. I look forward to hearing your own unique ideas!

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/?term=Deep+Dyspareunia+in+Endometriosis%3A+A+Proposed+Framework+Based+on+Pain+Mechanisms+and+Genito-Pelvic+Pain+Penetration+Disorder>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/30078464>

Citation #3:

nan

Keyword #1:

Endometriosis

Medicine



Keyword #2:

Deep Dyspareunia



Name:

Darra Lynn Hofman

Degree or Position:

Ph.D.

Institution:

UBC

Department:

iSchool

Field of Research:

Privacy, transparency, and digital records (including blockchain)

Quick summary of your research (200 words max):

I study privacy, identity, and human rights in records, with a particular focus on the impact of digital recordkeeping technologies such as blockchain. My dissertation focuses on the relationship between transparency and privacy in digital records. I am a Graduate Academic Assistant with both InterPARES Trust (<https://interparestrust.org/>) and Blockchain@UBC (<https://blockchainubc.ca/>).

Summary of what you would like to do with your mentees (400 words max):

I'm fairly open to projects looking at the intersection of archives, records, and law (which is admittedly a pretty big field!). I also would encourage anyone with a strong interest in blockchain technology (aka distributed ledger technology, which underlies Bitcoin, Ethereum, and other cryptocurrencies) to bring their research ideas to my group! Although my personal expertise is in privacy, there are a number of issues



in this space, including e-government/open government; discrimination from algorithmic decision making; and personal rights beyond just privacy. Because archival science is only taught at the master's level and above in North America, I imagine the process beginning with some (simple!) reading (given by me) about archival theory to ground the group as they begin their lit review. Based on the lit review, we will draft initial research questions, then return to the literature to refine the research question(s). Once we're happy with our research question(s), we will design our methodology and predict our results.

Citation #1:

D. L. Hofman, "Legally Speaking: Smart Contracts, Archival Bonds, and Linked Data in the Blockchain," 2017 26th International Conference on Computer Communication and Networks (ICCCN), Vancouver, BC, 2017, pp. 1-4.

doi: 10.1109/ICCCN.2017.8038515 keywords: {contracts; Linked Data; ontologies (artificial intelligence); smart contracts; archival bonds; semantic legal layer; blockchain based legal contracts; contract formation; legal language; contract drafting; jurisdiction-specific legal ontologies; distributed ledger; Linked Data technology; Contracts; Law; Ontologies; Semantics; Batteries}, URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8038515&isnumber=8038338>

Citation #2:

Hofman, D., Duranti, L., & How, E. (2017). Trust in the Balance: Data Protection Laws as Tools for Privacy and Security in the Cloud. *Algorithms*, 10(2), 47 – 58.

Arts



Citation #3:

nan

Keyword #1:

Privacy

Keyword #2:

Blockchain



Name:

Alex May

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Physics and Astronomy

Field of Research:

quantum mechanics, relativity, gravity

Quick summary of your research (200 words max):

I work on quantum gravity, which is the field of research that tries to put everything we know about physics together into one package, and ultimately hopes to address the biggest questions about the universe - how did the universe start and how will it end, what is the origin of the fundamental particles and forces, and so on.

In recent years it's been understood that a fruitful approach to quantum gravity is to think of the universe as a computer, and ask how it can and cannot process information. In this line of thinking there are some surprisingly simple questions that haven't yet been addressed - perfect questions for an undergraduate to work on!

Summary of what you would like to do with your mentees (400 words max):

There are two main directions I'm interested in taking with my REX students, with which one we go depending on students background and



interest. The first direction involves a simple toy (see <https://www.youtube.com/watch?v=OBblzclTVlg&t=20s>) which exhibits an interesting motion. The REX students could analyze experimentally, theoretically using Newtonian physics, and possibly using a simple computer based simulation. The second direction involves quantum physics, and is more suitable for more advanced students. Quantum entanglement is one of the most useful resources in quantum mechanics: it has been described as the "elbow grease" of the quantum world. This project is about how quantum entanglement can move through space and time. Understanding this has important implications for aspects of cryptography and even high energy physics.

Citation #1:

<https://www.quantamagazine.org/tensor-networks-and-entanglement-20150428/>

Citation #2:

<https://arxiv.org/pdf/1806.04154.pdf>

Citation #3:

<https://www.repository.cam.ac.uk/handle/1810/274930>

Keyword #1:

physics

Keyword #2:

mathematics



Name:

Soheila Zarei

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Cellular and Physiological Sciences

Field of Research:

Pancreatic cancer

Quick summary of your research (200 words max):

To examine the cellular and molecular mechanisms underlying the development of pancreatic diseases, we are focused on understanding how specialized cell types of the pancreas are formed and how they contribute to diseases. To do this, we utilize mice to study pancreatic development and model aspects of pancreatic disease. Studies in mice have shown that acinar cells can give rise to ductal adenocarcinoma, but it is unclear what role ductal cells have in the initiation of the disease. Thus far, it has not been possible to address this issue, but we have developed mouse models that induce cancer initiating mutations in each cell type to address this open question and examine how each cell type affects the biology of pancreatic ductal adenocarcinoma.

Summary of what you would like to do with your mentees (400 words max):

I will be following what our lab is interested in as a simple understanding language for my mentees like last year. I am looking for 3rd



and 4th year students who show their real enthusiasm to cancer research (molecular biology of cancer) as they might have a chance to stay in the lab. Last year I was able to bring one of my mentees to our lab as volunteer.

Citation #1:

10.1136/gutjnl-2017-314426

Citation #2:

10.1016/j.ccr.2012.10.025

Citation #3:

nan

Keyword #1:

Pancreatic cancer

Keyword #2:

molecular biology



Name:

Kate Wahl

Degree or Position:

Master's

Institution:

UBC

Department:

School of Population and Public Health

Field of Research:

Sexual and reproductive health

Quick summary of your research (200 words max):

Endometriosis is a common gynecological condition in which the lining of the uterus grows elsewhere in the body, often causing painful periods, sexual intercourse, and/or bowel movements. My research focuses on the sexual pain that women with endometriosis experience. In particular, I am conducting a study aimed at creating a patient-reported outcome measure of sexual pain for use in clinical trials and other research. I am also interested in how sexual pain affects quality of life - for example I recently completed a study examining the relationship between sexual pain and concerns about infertility. In the future, I hope to investigate the impact of educational interventions on age of referral for endometriosis care in pediatric populations.

Summary of what you would like to do with your mentees (400 words max):

I would like to work with a team of motivated students to design and implement a study in the area of reproductive and sexual health. Although



my own research focuses on endometriosis, I am also happy to help develop a study in other areas in this field (e.g., barriers to uptake of contraception, sexual arousal disorders, femtech).

Citation #1:

<https://dl.acm.org/citation.cfm?doid=3173574.3174139>

Citation #2:

<https://www-ncbi-nlm-nih-gov.ezproxy.library.ubc.ca/pubmed/28778699>

Citation #3:

nan

Keyword #1:

Endometriosis

Keyword #2:

Sexual health



Name:

Paisly Symenuk

Degree or Position:

Master's

Institution:

UBC

Department:

Nursing / School of Population and Public Health - Faculty of Medicine

Field of Research:

global health

Quick summary of your research (200 words max):

My current research and involvement is related to global health leadership and student/new graduate health worker involvement in decision-making. Additionally, my research also focuses on how global health is taken up and introduced in undergraduate health education.

Summary of what you would like to do with your mentees (400 words max):

A exploratory institutional scan of UBC exploring the definition, interest, motivation, priorities, skills, and experiences of undergraduate and graduate students as they relate to global health. This will be a survey-based method including scales and unstructured data. This will include exposure to qualitative thematic analysis, some basic descriptive and inferential statistics, and research communication strategies.

Citation #1:

<http://linkinghub.elsevier.com/retrieve/pii/S2214999616300777>

Citation #2:



<http://www.sciencedirect.com/science/article/pii/S2214999617306367>

Citation #3:

nan

Keyword #1:

global health

Keyword #2:

students



Name:

Miguel Ramirez

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Genome Sciences and Technology

Field of Research:

Cerebellum development genetics

Quick summary of your research (200 words max):

My research primarily investigates the genetics governing the development of the cerebellum. The cerebellum is the area of the brain primarily associated with fine motor movement and coordination, however recent evidence suggests a role in cognitive and emotional processes. While the anatomical and histological details of cerebellar development have been well described, the genetic underpinnings remain relatively unknown. Therefore, our lab uses mice as a model organism to systematically analyze the expression of genes throughout the mouse genome during embryonic and postnatal cerebellar development. Through collaboration with the FANTOM5 Consortium, the cerebellar expression profile has been analyzed from 12 different time points using a technique known as cap analysis gene expression followed by high-throughput sequencing.

Summary of what you would like to do with your mentees (400 words max):



The aforementioned dataset has led to the generation of many new ideas and projects in the lab therefore the focus of the research project can be catered to particular interests. Deriving biological meaning from such a rich dataset is challenging and in doing so the students will develop skills necessary for a researcher in the combined fields of genomics and neuroscience. Additionally, the project should inevitably contribute to the field and aid translational research for developmental disorders such as autism, where cerebellar developmental defects have been implicated.

For the project specifically, a possible avenue can be biological interpretation of a gene expression network developed from the dataset. In this case, highly connected “hub” genes can be further investigated for their role in cerebellum development. This would involve creating rationale for choosing novel genes of interest as well as an experimental plan to uncover its role in cerebellar development.

If interest lies in non-traditional regulators of gene expression, the dataset has also allowed for the analysis of transcripts expressed from non-coding regions, such as enhancers and microRNAs, making it possible to identify functionality specific to the cerebellum. This would require a simplistic bioinformatics based approach, followed by validation experiments. The choices are wide open and I would be more than happy to talk about new ideas not already created in the lab.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/9735945>

Citation #2:

<https://www.nature.com/articles/sdata2017113>



Citation #3:

<https://www.nature.com/nature/journal/v507/n7493/full/nature13182.html>

Keyword #1:

Developmental genetics

Keyword #2:

Neuroscience



Name:

Caitlin Pritchard

Degree or Position:

Master's

Institution:

UBC

Department:

Microbiology and Immunology

Field of Research:

Immune Cell Biology

Quick summary of your research (200 words max):

Hi! Iâ€™m a 3rd year Masterâ€™s student in the Department of Microbiology and Immunology studying immune cell biology. Iâ€™m interested in how cells regulate their actin cytoskeleton infrastructure and how important that regulation is for certain cell behaviours and responses. The cell type that I focus on is called a mast cell. Mast cells are immune cells that act as front-line defenders against invading pathogens but when the immune system becomes dysregulated, they are famous for their role in allergy and inflammation. Mast cells are filled with storage vesicles containing large amounts of inflammatory mediators such as histamine and when the contents of these vesicles are released, we experience symptoms of allergy (itching, redness, and swelling). In severe cases, allergic reactions can lead to anaphylaxis and death. Interestingly, the actin cytoskeleton can have a huge impact on whether these vesicles are released in response to an allergen and there are many cellular proteins that work together to



regulate that actin. If we can better understand which proteins are involved in regulating the actin cytoskeleton during allergic responses, we may be able to identify targets for future drugs to treat allergies!

Summary of what you would like to do with your mentees (400 words max):

I am hoping to work on a mini project to identify different actin regulatory proteins that may be important for mast cell responses. We can do a literature search to identify targets of interest and then design a project based on some of the proteins we choose. If we have time, we can test some of the target proteins in the lab (likely with mentees shadowing). We can work with different types of assays to look at the release of inflammatory mediators and the amount of change to the actin cytoskeleton in in vitro mast cell cultures.

Iâ€™m also excited to hear your ideas if there are things that you are interested in working on or learning more about!

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/27393494>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3360219/>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/23153585>

Keyword #1:

Immunology

Keyword #2:

Cell Biology



Name:

Ali C. Kheirabadi

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Mechanical Engineering

Field of Research:

Dynamics and control engineering

Quick summary of your research (200 words max):

My research goal is to increase the efficiency of offshore wind farms. When multiple wind turbines are installed in close proximity, the machines that are located upstream extract the wind's kinetic energy, which lowers the wind power available to downstream turbines.

By modelling the dynamics of individual turbines and the aerodynamic coupling between a group of turbines, it is possible to develop solutions that increase power production from the entire wind farm. For example, yawing an upstream turbine's rotor (google this) causes the low-energy air flowing downstream to deflect to the side, which exposes downstream machines to higher-power wind.

Investment in offshore wind energy technology has been growing exponentially since the start of the century, and wind farm developers are searching for methods to increase efficiency in order to reduce the cost of wind power.

Summary of what you would like to do with your mentees (400 words max):

Students may work on any engineering research project related to dynamics, heat transfer, thermodynamics, fluid dynamics, and control systems engineering. A few projects that I would recommend include:

1. Modelling floating offshore wind turbines and using experiments to validate the accuracy of dynamic models. There is generally a lack of experimental validation in the fields of dynamics and control. Gaining exposure to experimental techniques in these fields is therefore valuable experience.

2. Instead of developing a model and validating this model using experiments, experiments may be used to build dynamic models directly via a process referred to as system identification. Experience with this technique is in high demand since most real-world processes are too complex and unpredictable to be modelled mathematically.

3. Researching novel methods for cooling electronics within data centers. As server electronics become more powerful and densely packed, liquid cooling technologies become necessary for preventing equipment overheating. Designing cooling systems will offer experience in the fields of heat transfer, fluid dynamics, and thermodynamics. Such a research project may be approached experimentally, or numerically through mathematical modelling.

4. Developing control systems for wind turbines, electronics cooling equipment, power plants, vehicles, aircraft, etc. A control system is an instrument that allows machines to automatically behave in a desired



fashion without the need for human interference. Common examples include cruise control in vehicles, automatic pilot in aircraft, or automation in the manufacturing industry. Control systems are also hardwired into the human brain and they are what allows us to stand upright and coordinate our actions. The student team may pick any system, build a mathematical model, and develop a control system to automate its functions. Validation against experiments is possibly an additional research goal.

Citation #1:

<https://doi.org/10.1002/we.1810>

Citation #2:

<https://doi.org/10.1002/we.1822>

Citation #3:

<https://doi.org/10.1016/j.applthermaleng.2016.03.056>

Keyword #1:

Wind energy

Keyword #2:

Dynamics and control



Name:

Travis Salway

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

School of Population and Public Health

Field of Research:

LGBTQ2 Mental and Sexual Health

Quick summary of your research (200 words max):

<http://blogs.ubc.ca/travissalway/research/>

Summary of what you would like to do with your mentees (400 words max):

I will support my mentees in conducting a focused quantitative or qualitative analysis of existing data relevant to social aspects of public health. My area of expertise is addressing social disparities in health that affect lesbian, gay, bisexual, transgender, queer, and Two-Spirit adults.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/27049424>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/28821997>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/29938602>

Keyword #1:

LGBTQ2

Medicine



Keyword #2:

Public health



Name:

Matilde Balbi

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Psychiatry

Field of Research:

Stroke

Quick summary of your research (200 words max):

I am a postdoctoral fellow working at UBC's department of Psychiatry. I am working on strategies for stroke recovery based on neuronal activity. Stroke results in an irreversible primary injury, and a salvageable secondary injury in the surrounding tissue. My research aims to develop therapies to target this secondary injury in animal models of stroke.

We are developing automated systems to assess various strategies for stroke recovery. Our current setup consists of a high-tech home cage housing up to 10 mice. The cage has several modules for automated functional brain imaging, animal weighing, reward-based learning, and robot-assisted motor recovery.

Summary of what you would like to do with your mentees (400 words max):

Project 1: We are currently looking into adding optogenetic stimulation and transcranial electric stimulation modules into our automated home



cages. Mentees are expected to do in-depth literature research on the activation patterns of different neuronal types in response to optical stimulation of diverse light-sensitive proteins used in optogenetics. Research may also be conducted on the effects of different modes of transcranial electric stimulation on neuronal activity. Original contributions are expected to include theoretical mechanisms of neuronal stimulation within this framework, experimental protocols to test these mechanisms, as well as potential avenues for translational research of direct brain stimulation after stroke.

Project 2:

Forelimb movements are a refined feature of the mammalian motor system. Goal-directed limb movements integrate relevant sensory inputs and motor commands. The resulting movement trajectory and kinematics lie in a high dimensional space, which is intractable for manual rating. We are developing machine vision and supervised learning algorithms to automate paw tracking and posture classification for our robot-assisted motor recovery module. Mentees are expected to research and familiarize themselves with the machine learning algorithms used in this project and contribute in the training of non-linear classifiers for posture classification. Mentees may also develop methods to identify sensorimotor pathways affected based on posture and paw tracking after stroke, as well as experimental protocol to verify these neurological impairments.

Citation #1:

Medicine



<https://www.nature.com/articles/ncomms11611>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/28721356>

Citation #3:

nan

Keyword #1:

stroke

Keyword #2:

recovery

Name:

Zhihao Wang

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Mechanical Engineering

Field of Research:

Thermofluids, clean energy

Quick summary of your research (200 words max):

Natural gas now is considered one promising clean energy in the future. Generally, natural gas is liquefied (LNG) in the cryogenic tank. Although the storage tanks are equipped with high-efficiency insulation, heat leak unavoidably is transferred into the tanks. Thus some of LNG will vaporize (boil-off gas (BOG)), increasing overall pressure. In order to maintain the tank pressure not exceed the maximum allowable working pressure, the boil-off gas (BOG) is continuously. As LNG vaporization changes the composition of remaining LNG, this will gradually affect the thermal properties.

The proposed research will investigate a practical solution to design zero-emissions LNG distribution networks and refueling stations with minimal environmental impacts. In this research, I will mainly answer the following questions

1)What are the requirements to improve LNG bulk transfer with minimum

vented methane?

2)What is the heat buildup and pressure rise in LNG storage tanks?

3)What are limitations on maximizing LNG transfer rate in tanker-truck-to-storage-tank to minimize heat transfer to LNG?

Numerical software Aspen Package and Ansys Package (CFD model) will be adopted to conduct the numerical research. The complete research can be divided into two tasks. storage tank modeling and on-site data measurement to validate the numerical results.

Summary of what you would like to do with your mentees (400 words max):

I would like to study any thermofluids projects, preferably on the clean energy. The theoretical parts involve the fluid mechanism and heat transfer. For example,

Topic: heat transfer inside the LNG (Liquefied natural gas) tank

Abstract: Inside the LNG tanks, heat leak from the environment would cause the density of the LNG, pressure rise, and evaporation. The variation of LNG density change would lead to the fluid motion inside the tank and thermal stratification. This project would focus on the factors which affect the fluid motion and heat transfer characters. Two research methods will be employed. One is numerical method: Ansys CFD model and C++ programming, etc. are used. The numerical model (fluid motion, phase change, etc.) will be established. Based on the results from the Ansys CFD model, a simplified model will be conducted. The simplified model will neglect the minor fluid motions and consider the main factors which affect the heat transfer, and some assumptions would be made. The simplified

model is programmed using C++ (or matlab). Another method is the experimental research. This involves the setup of the experiment inside the cryogenic tank (For safety reasons, the LNG would be replaced by liquid nitrogen), the key experimental parameters determination, the precision and uncertainties of the measurement, the procedure of experiment, and expected results.

Time line:

For numerical method:

September: Literature review, the project details understanding, basic software learning

October: Numerical model setup, CAD model, mesh generation

November-December: Preliminary numerical results obtained, and numerical data will be analyzed

January: Simplified model will be studied based on the numerical results from commercial software

February-March: Codes work for the simplified model

April: Preliminary results obtained from the codes

May: Summary of the numerical method

For experimental method

September: Literature review, the project details understanding

October: Key experimental parameters determination, main measurement instrument information collection

November-February: Experiment setup and experimental procedure

March-April: calibration work, and preliminary measurement.

May: Summary

Citation #1:

<https://www-sciencedirect-com.ezproxy.library.ubc.ca/science/article/pii/S0894177717304004?via%3Dihub>

Citation #2:

<https://www-sciencedirect-com.ezproxy.library.ubc.ca/science/article/pii/S0360319917329919>

Citation #3:

<https://www-tandfonline-com.ezproxy.library.ubc.ca/doi/abs/10.1080/10407782.2016.1264771>

Keyword #1:

LNG

Keyword #2:

thermal stratification



Name:

Feng Xu

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Pathology and Lab Med

Field of Research:

COPD & IPF mechanism exploration with computational technology

Quick summary of your research (200 words max):

Currently, I am focusing on utilizing the high throughput data to identify the biomarkers of complex disease such as COPD or IPF. With these invaluable biomarkers, scientist could gain better insight into the development of the disease and further study the influence of other disease related factor such as environment, microbiome around the patients, and even the behavior of the patients. These studies might play crucial roles in the coming precision medicine period and benefit the humans in the field of public health.

Summary of what you would like to do with your mentees (400 words max):

Frankly, I would like to make these program a brand new exploration in the field of biomedical science rather than another lecture for the mentee. Ideally, the mentee would be the person who mainly promotes the project. My role in the program could be a person who inspires you to find your own way to overcome the obstacles in the corresponding projects. I would like



to use my experience in research to deliver effective communications so that the mentee would know what is biomedical research really like, how to identify the research gap in a project, how to overcome the difficulties etc. In case the mentee is not willing to pick the topic by themselves so as to gain the useful research skills from the real research in a relative short period (several months in the REX program), I would suggest a project to my mentee. Then we would solve the difficulties in the research project and experience the exciting scientific discovery together. If we work efficiently, I believe we could get a publication at the end of this REX program.

If the mentee is interested in the COPD or IPF related researches that I am focusing on in HLI, UBC. It would be great. We would like to figure out whether some human genes perform abnormally in the process of the diseases and thus lead to the malfunctions of human lungs. Moreover, the microbiome in the human lung would also be studied to explore if the microbe contribute to the disease development in the human host. If everything goes well, I hope the project could be finished at the end of this year.

Besides the COPD or IPF related researches, I would also like to join the projects concerns bioinformatics tool development, cancer genomics, regulatory network constructions, on which I have some research experiences before I come to UBC. For the other projects that I am not that acquaintance with, I would also like to challenge myself with the mentee. I am really looking forward to make something difference in the exciting unknown fields with the mentee ASAP.



Letâ€™s work together and promote the progress of biomedical Research.

Citation #1:

Feng Xu*, D. M. Vasilescu, D. Kinose, N. Tanabe, S. Verleden, B. Vanaudenaerde, J. D. Cooper, M. E. Lenburg, A. Spira, R. Ng, J. C. Hogg. A Morphometric â€œHot Spotâ€• for Terminal Bronchiolar Destruction in COPD. Am J Respir Crit Care Med. 2018;197:A7364.

Citation #2:

Yuchuan Wang, Ligang Hu, . Feng Xu, Junwen Wang, Hongzhe Sun*. Integrative approach for analysis of proteome-wide response to bismuth drugs in Helicobacter pylori. Chemical Science, 2017 Apr 19;. doi: 10.1039/C7SC00766C

Citation #3:

Feng Xu, Weixin Wang, Panwen Wang, Li M J, Chung Sham P, Junwen Wang*. A fast and accurate SNP detection algorithm for next-generation sequencing data. Nat Commun 3, 1258, 2012

Keyword #1:

Biomedical Research

Keyword #2:

Bioinformatics & Computational biology



Name:

Mohammd Najjarzadegan

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Electrical and Computer Engineering

Field of Research:

Electronics, Analog and Mixed-signal circuits

Quick summary of your research (200 words max):

I am a Ph.D. student at System on Chip (SoC) laboratory in ECE department with major in electronics. I am currently working on the design and implementation of Electrical Impedance Spectroscopy (EIS) hardware for fuel cells and batteries, in collaboration with Greenlight Innovation. As part of my master's thesis I implemented the wireless power and data telemetry units for implantable microsystems like Deep Brain Stimulator (DBS), Pacemaker and Cochlear implant. My research background and interests include 1) electronic instrumentation, 2) wireless power transfer, and 3) analog and mixed-signal circuit design. A brief explanation of each field is provided below.

Summary of what you would like to do with your mentees (400 words max):

In the area of electronic instrumentation, circuit designers try to implement circuits that can measure very low and weak signals (e.g. voltage or current) with high degree of accuracy. For example, to capture



the vibration signal from the earth to study the earthquake, we need an extremely precise circuit that can discern this weak signal. The noise, nonlinearity, and drift with temperature are some of the challenges that need to be addressed. Currently, I am designing a circuit for measuring the voltage in micro-volts range of each cell across a fuel cell stack of hundreds of cells. This signal contains key information about the fuel cell functionality and characteristics.

Wireless Power Transfer (WPT) is not only a classic problem but also an active research area for modern applications. More than 100 years has passed from the first experiment Nikola Tesla did to transfer the power wirelessly; nevertheless, this problem has not been fully solved today. The application of WPT ranges from biomedical implantable devices, which absorb their power demand wirelessly from outside of the body, to modern industrial applications such as electric vehicle charging. The most common method to transfer power is using coils (like a transformer), but other methods such as capacitive links and ultrasound transponders increase the applicability and flexibility of WPT systems.

Before the first programmable digital computers that were built in 1940-50s, all electronic circuits were analog. This revolution was later complemented by the development of the CMOS technology and digital circuits started to become indispensable part of systems. The digitization trend has continued to this date. However, digital circuits need an interface to communicate with the real world which is the analog domain. The “mixed-signal” field of Analog to Digital Converter (ADC) and



Digital to Analog Converter (DAC) was thus emerged. The field encompasses more than ADC and DAC design; high-speed wireline communication, for instance, is one of the hottest topics in mixed-signal nowadays attracting many researchers's attention.

You can find further information about my contribution to the mentioned areas in my Linked-in, Research Gate or Google Scholar profiles.

I am looking for motivated students in the ECE department, who would like to conduct research in the aforementioned or relevant areas. Our main goal is to do all the steps of the research together. While obtaining a "good" result is commonly conceived to be the outcome of a research, showing that something "doesn't work" is equally valuable. Finally, we can think of presenting the outcome of the research in a relevant conference or even have them published as a journal article. Most of projects in electronics need implementing a prototype version which requires laboratory work. Thus, the engineering students who join this program will have the opportunity to improve their hands-on experience, in addition to participate in the state-of-the-art research.

Citation #1:

<https://scholar.google.com/citations?user=E-lhJCEAAAAJ&hl=en>

Citation #2:

https://www.researchgate.net/profile/Mohammad_Najjarzadegan

Citation #3:

nan

Keyword #1:

instrumentation, wireless power transfer

Applied Science



Keyword #2:

analog and mixed-signal, biomedical circuit design.

Education



Name:

Rose Maghsoudi

Degree or Position:

Ph.D.

Institution:

UBC

Department:

HDLC

Field of Research:

Cyber bullying

Quick summary of your research (200 words max):

Understanding sense of safety and cyber bullying among adolescents

Summary of what you would like to do with your mentees (400 words max):

Help them to reach their goal.

Citation #1:

https://s-r-a.org/wp-content/uploads/2010/03/2018_SRA_Program_Book.pdf

Citation #2:

<http://www.teenslives.com/about-us/>

Citation #3:

nan

Keyword #1:

Cyber bullying

Keyword #2:

Online safety

Name:

Mahsa Khalili

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Biomedical Engineering

Field of Research:

Assistive Technologies

Quick summary of your research (200 words max):

My research is focused on wheeled mobility assistive devices, e.g., manual wheelchairs, power wheelchairs, scooters, and power-assisted manual wheelchairs. Each of these devices provide benefits to their users, however, they also impose some limitations. In my research, I am focusing on understanding daily life challenges and needs of wheeled mobility assistive device users and addressing these needs by making modification to the existing assistive technologies or developing new mobility assistive devices.

Summary of what you would like to do with your mentees (400 words max):

Understanding the biomechanics of wheelchair propulsion, e.g., kinematics and kinetics of wheeling a manual wheelchairs, when performing different tasks including, wheeling on flat or inclined surfaces.

Citation #1:

<https://www.sciencedirect.com/science/article/pii/S0003999302581958>



Citation #2:

<https://www.sciencedirect.com/science/article/pii/S0003999309006182>

Citation #3:

<https://link.springer.com/article/10.2165/00007256-200131050-00005>

Keyword #1:

Wheeled mobility assistive technologies

Keyword #2:

Biomechanics of wheelchair propulsion

Nursing



Name:

Allie Slemon

Degree or Position:

Ph.D.

Institution:

UBC

Department:

School of Nursing

Field of Research:

Equity in health care

Quick summary of your research (200 words max):

Emergency departments are intended to provide necessary and life-saving health care for all, but Indigenous people, people with mental health challenges, and other groups who are marginalized often receive discriminatory treatment from health care providers. This can significantly worsen health outcomes for people who already face stigma in society.

My PhD research is part of a larger study that is developing interventions in three emergency departments in British Columbia to improve health care delivery for everyone who comes in the door – particularly people who currently experience unfair treatment. The goal of this project is to enhance equity in these emergency departments. What is equity? Ensuring that everyone receives safe, non-discriminatory care.



My own project will look at how nurses' everyday patient care changes throughout this intervention: Do nurses draw on ideas of equity and social justice in caring for patients? What factors in the hospital environment help or hinder nurses in treating patients more equitably? It is important to study everyday patient care because it is these daily interactions between nurses and patients that can make a big difference in a person's experience of an often frightening emergency department visit!

Summary of what you would like to do with your mentees (400 words max):

I'm open to any research project that you think would be a good fit! I am particularly interested in working with students who want to do research that challenges how things are currently done in health and health care. My nursing clinical background is in mental health nursing and have research experience in a number of related fields: mental health, substance use, harm reduction, homelessness, outreach, equity and social justice. If you have interest in any of these areas, let's work together!

I work from a social justice perspective, which means I always aim to approach research with a critical eye to how our society operates. I recognize that power and privilege shape who receives excellent care in our health care systems and who is excluded or experiences discrimination. These ideas may resonate with you, or they may be completely new to you. Either way, we will start our time together by learning together about social justice in health and health research. This can help us get a



better idea of not only what our shared research interests are, but also how we want to plan our proposed study.

Working with me, you will get the opportunity working with me to delve into the literature on your chosen topic. We will use this literature review to refine your topic and come up with new ideas for how to plan your research study. I recently taught a health research methods course, and have lots of resources for you in learning about developing research questions and selecting a research methodology and methods. I can help guide you in applying all of your learning about research to a meaningful and important topic, and you will gain skills that will help you in your future studies and potentially future research!

Citation #1:

<https://equityhealthj.biomedcentral.com/articles/10.1186/1475-9276-11-59>

Citation #2:

<http://journals.sagepub.com/doi/abs/10.1177/1049732310385824>

Citation #3:

<https://onlinelibrary.wiley.com/doi/abs/10.1111/nin.12199>

Keyword #1:

equity & social justice

Keyword #2:

health



Name:

Helina Jolly

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Institute for Resources Environment and Sustainability

Field of Research:

Ecosystem services, Indigenous (Adivasi) of India, Forest management

Quick summary of your research (200 words max):

Forests are central to the life of Adivasis in India, and they play a critical role in the social, economic and cultural wellbeing of these traditional societies. However, the majority of the state-sanctioned forest management strategies have paid inadequate attention to the traditional Adivasi societies and their longstanding association with the land. These conservation focused policy practices, displaced Adivasi communities from their ancestral forestlands converting these regions into Protected Areas. The displacement from the forests and consequent resettlement had immediate effects on their livelihood, security and rights often revealing long-term damage in the form of inter-generational trauma and sense of abandonment. The proposed study will be to examine how post-independence forest policies in India have been (or have not been) able to accommodate the indigeneity-based ecosystem perspectives and knowledge. The work will explore the predicament of hunter-gatherers

Kattunaikar (Nayaka) communities of Wayanad forests in Kerala (South India). The project will provide empirical insights into how Adivasis identify, characterise and perceive ecosystem services; it will also examine how their security and rights are predisposed by the interactions with the forest as a function of contemporary forest policies. Practically, this research will inform future policy making as well as societal investments to have Adivasi inclusive strategies in managing natural resources in India. Moreover, the insights from this research will support the broader development objectives, placing the extreme significance of policies about women empowerment, indigenous community protection and environmental conservation.

Summary of what you would like to do with your mentees (400 words max):

I am excited to work with someone whose academic or professional interests intersects with environmental sciences, anthropology and psychology. I would encourage anyone with a strong affiliation to address global challenges such as climate change and biodiversity conservation. My work has an active component of understanding human perceptions of nature and natural resources. I also run a parallel study on human perceptions of nature through The Everyday Nature (www.theeverydaynature.com). Ideally, I would like to bring up UBC based perception study, which underlines perceptions and values of UBC students towards nature and natural resources (an extension of the ongoing project). The ideal timeline would be (a)Literature Review (c) Run a web-based perception project (d) Evaluate the data (quantitatively and qualitatively) (e) Disseminate the

results in the form of webpage, book and papers.

Citation #1:

<http://www.humanecologyreview.org/pastissues/her151/viningetal.pdf>

Citation #2:

<http://journals.sagepub.com/doi/pdf/10.1177/0013916508318748>

Citation #3:

<https://www.tandfonline.com/doi/abs/10.1080/10871200701555261>

Keyword #1:

Environment, Biodiversity, Indigenous

Keyword #2:

Climate Change, Nature, Perceptions



Name:

Bei Jiang

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Interdisciplinary Studies Graduate Program

Field of Research:

Urban planning, sustainability, environment assessment

Quick summary of your research (200 words max):

My research spans ecosystem services, rain gardens, urban infill, and heritage conservation. My doctoral thesis is about the integration of ecological principles into contemporary design forms, and gaining informative feedback from the practice to advance sustainability frameworks. This project investigates the possibility of integrating ecological knowledge into planning practice by applying the Ecosystem Services (ES) assessment. The objective is to inspire urban planning practices that can better achieve urban sustainability through ES research.

Summary of what you would like to do with your mentees (400 words max):

I love cities and technology. I have 3 years of teaching and mentor experience at the university level. My background in urban design and architecture give me the ability to solve planning and landscape problems better. I am familiar with landscape design and modelling, skillful to



coach hand drawing, sketches, computer-based tools to present ideas. I am also confident to explain research methodology to undergrads.

I would like to show mentees the appropriate work ethics with strong leadership, helping them with communication skills to work in a multi-disciplinary environment.

Citation #1:

<http://www-tandfonline-com.ezproxy.library.ubc.ca/doi/abs/10.1080/09640560802117028>

Citation #2:

https://www.colby.edu/biology/BI17x/writing_papers.html

Citation #3:

<https://people.uwec.edu/piercech/ResearchMethods/Data%20collection%20methods/DATA%20COLLECTION%20METHODS.htm>

Keyword #1:

Sustainability

Keyword #2:

Multi-functional ecosystems

**Name:**

Louis-Alexandre Fournier

Degree or Position:

Master's

Institution:

UBC

Department:

Interdisciplinary Oncology Program

Field of Research:

Oncology, Genome Instability

Quick summary of your research (200 words max):

Cancer is caused by the accumulation of mutations in normal DNA. High rates of mutations, termed "genome instability", contributes to the development of cancer. One process by which genome instability can arise is through improper pairing of RNA and DNA, resulting in a hybrid structure called an "R-loop". Genome instability resulting from R-loops has been related to changes in how the genome is packaged, although how these changes affect R-loop accumulation is poorly understood. Defects in a "genome packaging" regulator called the BAF complex are found in about 20% of cancers, including breast and lymphatic cancers. I hypothesize that the loss of one specific BAF subunit, alters the R-loop profile of a cell, thus disturbing the DNA landscape to promote cancer development. However, the detailed mechanism of how this occurs remains to be uncovered. My project will characterize the effects of BAF complex loss on R-loop accumulation and genome instability using the



gold-standard tools in the field to evaluate R-loop accumulation and detect genome instability in model cancer cell lines. In parallel, I will also use a large-scale CRISPR screen to uncover genes that become essential for cell survival when BAF function is lost. Ultimately, my research will provide new knowledge on how BAF complex dysfunction promotes cancer development, and will uncover compensatory pathways that could be targeted to selectively kill such cancers, improving the prognosis and quality of life of patients.

Summary of what you would like to do with your mentees (400 words max):

Hi! I am a Masters student in the Interdisciplinary Oncology Program who is interested in cancer epigenetics. I am more specifically interested by gene expression regulation in cancer cells. My research aims to uncover new targets for the treatment of rhabdoid tumours, a very aggressive type of pediatric tumours. My project focuses on mutations in the chromatin remodelling complex SWI/SNF, which has been associated with this type of tumors, as well as many other cancers. I am currently using CRISPR/Cas9 pooled screens to uncover synthetic lethal targets in Swi/Snf mutated cancers (see more above).

I believe that cancer research is an ideal field for REX students to explore. Oncology is a very dynamic field, with the number of publications more than doubling over the past 15 years! Lately, our understanding of the disease has tremendously improved, although there a lot of questions remain to be answered. This implies that there is a tremendous amount of



data available publicly on which one can design an undergraduate research project like REX.

As of now, I do have ideas for research projects that could be undertaken under my supervision. An example of such a project would be to look through the data available on cancer metabolism and possibly identify a pathway that could be targeted for therapy. For instance, people have looked at lactic acid secretion and its immunosuppressive effects in the tumor microenvironment. Data from these studies suggests that blocking lactic acid transporters could be used in therapy to improve prognosis. That being said, I would much rather discuss with my mentees before establishing the project, so that we can determine what their interests in research are. From there, we could build a project that will suit them better.

Moreover, although my research focuses primarily on cancer genetics and genome instability, I am comfortable with undertaking projects related to other fields of biology with students who would wish to do so. In fact, I hold a BSc in Microbiology and Immunology, and I have laboratory experience in DNA damage, stem cell, and Parkinson's Disease research.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/25854182>

Citation #2:

<http://genesdev.cshlp.org/content/28/13/1384.full>

Medicine



Citation #3:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3546152/>

Keyword #1:

Cancer

Keyword #2:

Genetics

Name:

Cary Wu

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Sociology

Field of Research:

social inequality

Quick summary of your research (200 words max):

I study how life course, social norms, and institutional structure (re)produce social disparities.

Summary of what you would like to do with your mentees (400 words max):

Develop innovative approaches to study social inequalities (e.g., video analysis, big data, and experiments)

Citation #1:

Finding critical trusters: A response pattern model of political trust :

<http://journals.sagepub.com/doi/abs/10.1177/0020715218761520>

Citation #2:

Local-national political trust patterns: Why China is an exception:

<http://journals.sagepub.com/doi/abs/10.1177/0192512116677587>

Citation #3:

Ethnicity, Democracy, Trust: A Majority-Minority Approach

<https://academic.oup.com/sf/article/97/1/465/4969879>

Keyword #1:

IVs: gender, ethnicity, education

Arts



Keyword #2:

DVs: social capital, mental health, and migration



Name:

Laura Morillas

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Earth Ocean and Atmospheric Sciences and Institute for Resources,
Environment and Sustainability

Field of Research:

eco-hydrology and climate change

Quick summary of your research (200 words max):

I am a biologist by training with a PhD on eco-hydrology and interests in climate change, ecosystem resilience to drought, and adaptation strategies for water scarcity. Nowadays I work as a Research Associate and Project Manager of the international project Agricultural Innovations in the Tropics (AgWIT). For more than 10 years I have been studying water dynamics under intensifying water scarcity conditions in natural and agricultural ecosystems around the world (Spain, USA, Canada, Brazil and Costa Rica).

Summary of what you would like to do with your mentees (400 words max):

I would like to support students interested in having a first research experience on topics related to my expertise (i.e., ecosystem responses to increasing water scarcity, sustainability assessment of water use in agriculture, evaluation of adaptation strategies to drought in



agricultural farms, or any other topic related to water scarcity and ecology). I have long-term quantitative data from research field stations on farms in north-western Costa Rica that could be used for the student's research if they find it interesting. Those data could support a wide range of research questions, from a more practical and applied water management perspective (i.e., "Do farmers adapt their crop management practices -irrigation- when water scarcity increases?" or "Are current remote sensing products good enough to inform farmers water management decisions?") to more eco-physiological aspects of water scarcity (i.e., "What are the traits of drought that hurt crops the most?" or "To what extent is crop productivity affected by water scarcity?"). These are just examples, and I would be more than willing to support research based on other geographical areas or topics where data is available or able to be gathered by the students.

My mentorship approach will be based on offering guidance, but the student should take the leadership of her/his research and find the research questions they want to answer. My experience is in quantitative eco-hydrology, but I would be happy to explore more qualitative approaches if that is what it takes to answer the research questions chosen by the student. I would first help the student to identify the research questions (research objectives) and to design a set of research methods to look for answers (data requirements and data analysis approach). After this, I will support any questions the student might have about data analysis and results interpretation and discussion. Finally, I will provide guidance



and feedback about research writing and scientific results communication.

Citation #1:

<https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2017JG004095>

Citation #2:

<https://www.nature.com/articles/nature10452>

Citation #3:

<https://ascelibrary.org/doi/10.1061/%28ASCE%290733-9496%282006%29132%3A3%28129%29>

Keyword #1:

ecosystem response to drought

Keyword #2:

sustainable agriculture



Name:

Sara Hosseinirad

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Electrical and Computer Engineering

Field of Research:

Control and Robotics

Quick summary of your research (200 words max):

Robotics was introduced to the welding industry in 1980. Since in high production application, such as the automotive industry, welding plays an important role, using robots for this task will sufficiently reduce the number of the required human expertise. Using machine learning knowledge, the weld quality can be assessed from vision, weld sound, welding parameters. High-Quality welding is considered as a reference point for controlling the welding robots. Next step, employing an advanced control technique, we can optimize the welding robot performance.

Summary of what you would like to do with your mentees (400 words max):

In my previous study, my research was about designing an optimal control strategy for a solar thermal water heating system. As a mentor, I would like to share my knowledge about optimization, control design, and renewable systems. I can spend some time to teach them the required theories and programming techniques for the related research. The

optimization and control design techniques can be employed for managing several systems such as economic, biological, social, mechanical, and electrical systems. Knowing a well-designed mathematical model for these systems, which means determining inputs, outputs, external disturbances, and parameters, using optimization and control techniques, we can improve the system's performance. Assume your favorite fast food restaurant. What was the longest time you have been waited in the line for buying a burger? How can you shorten the waiting line? Let us say you are the manager of the restaurant, and you can change the number of staff. If you increase the number of staff, you shorten the line. However, the budget of the restaurant is limited; thus, you cannot hire as many staff as you want. Since there is a trade-off in the number of the restaurant staff, having a well-defined mathematical model, you can optimize this number. Once you detect a compromise in one or more variables in the system of your research, you may require to define an optimization problem.

Citation #1:

<https://ieeexplore.ieee.org/document/7963396/>

Citation #2:

<https://www.sciencedirect.com/science/article/pii/S0924013612000866>

Citation #3:

nan

Keyword #1:

Control Design

Keyword #2:

Optimization



Name:

Shawn Shortill

Degree or Position:

Master's

Institution:

UBC

Department:

Medical Genetics

Field of Research:

Molecular and Cellular Biology

Quick summary of your research (200 words max):

The coordinated and timely delivery of protein cargos to their intended cellular destinations is an important part of normal cellular function and genetic perturbations to these sorting pathways can result in diseases such as late-onset Parkinson Disease and ALS. I use the budding yeast *Saccharomyces cerevisiae* as a model to explore the details of these disease-relevant sorting pathways. By gaining a better understanding of the molecular mechanisms of protein trafficking, I hope to identify novel therapeutic targets for the treatment of neurodegenerative disease.

At the Centre for Molecular Medicine and Therapeutics, I couple the unique ability of *S. cerevisiae* to facilitate large-scale genomic screening with targeted biochemical characterization. When used together, genetics and biochemistry are a powerful tool for dissecting the fine details of a molecular pathway. Since the sorting pathways I study are so highly



conserved throughout Eukaryotic cells, I am able to apply my findings in yeast to the homologous human pathways.

I am currently investigating the role of the small GTPase Rab5 and its activators (GEFs) in retrograde trafficking at the endosome. Using genomic approaches, I hope to identify new upstream regulators and downstream targets of Rab5 GEFs. Once identified I plan to biochemically characterize them.

Summary of what you would like to do with your mentees (400 words max):

A REX research project with me would have you picking up my project following the completion of a successful theoretical genome-wide screen for proteins that physically interact with my Rab5 activator (let's call this activator "Rav1" from now on). What are your next steps? Performing genome-wide screens is somewhat of a double-edged sword, as you (the researcher) are often faced with a tremendous amount of data, some of which is exciting and novel, but how do you begin to sort (pun intended) through it all?

Using clever biochemistry and computational biology, that's how! Working with me you will design an analysis pipeline for presumptive Rav1 physical interactors from the raw genomics data with the ultimate goal of proving that the given interactors are real.

Once we have proven that a given protein interacts with Rav1, can we begin to characterize the interaction? Thoughts toward mutagenesis and functional biochemistry?



Finally, if time permits we will design a simplified system in humans to see if there is a similar molecular interaction occurring between the human version of Rav1 and the human version of any interactors we found through our screen.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/?term=Vps9+domain-containing+proteins%3A+activators+of+Rab5+GTPases+from+yeast+to+neurons>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/19696797>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/?term=Rab5+GEFs+Bean>

Keyword #1:

Molecular Biology and Biochemistry

Keyword #2:

Genetics and Cell Biology

Forestry



Name:

Sushil Nepal

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Forest resource management (Biometrics)

Field of Research:

Spatial statistics and landscape ecology

Quick summary of your research (200 words max):

My research interests include Forest Biometrics, sampling, and spatial and temporal analysis techniques. My research focus is on the application of spatial statistics to characterize spatial patterns of individual trees, stands, and landscapes. I am a PhD student under the supervision of Dr. Bianca Eskelson. In my research project I am applying spatial analysis techniques to compare the forest structure at spatial scales over time in the Black Mountain Experimental Forest (BMEF), California, USA. I am using historical inventory data and recent inventory and LiDAR data from the BMEF.

Summary of what you would like to do with your mentees (400 words max):

I would like to help my mentees get acquainted with the basic statistics tools and techniques that are applicable to forestry. I want to give them hands-on experience on using the GIS tools like ArcMap. I would also like to teach them the computer application in forestry. Tools such as excel,



access and software like R would be great in the field and lab for forestry students, hence, I would like my mentees to be familiar with such tools and techniques used in forestry that is actually applicable in the field as well. I would also like to teach my mentees the basic idea about sampling, experimental design and handling big data in forestry.

Citation #1:

<https://doi.org/10.1088/1748-9326/aa5a2f>

Citation #2:

<https://doi.org/10.1007/s10310-015-0493-2>

Citation #3:

<http://www.cfs.nrcan.gc.ca/pubwarehouse/pdfs/4474.pdf>

Keyword #1:

Spatial statistis, Biometrics

Keyword #2:

, Landescape ecology, Forestry, Sampling, Experimental design, data science

Name:

Jem Patrick Tari

Degree or Position:

Master's

Institution:

UBC

Department:

Classical, Near Eastern and Religious Studies

Field of Research:

Digital Archaeology

Quick summary of your research (200 words max):

Looking at the intersection of technology and archaeology. Identifying future technical innovations (such as virtual and augmented reality) and seeing how they might be exploited to further our understanding of ancient people and societies.

Summary of what you would like to do with your mentees (400 words max):

I'm flexible and willing to be guided but I thought it might be interesting to step through the process of designing a cell phone based augmented reality tool that would allow for subsurface geophysics and magnetometry to be remotely visualised.

A use case for this might be a senior professor back at UBC able to walk around a car park or playing field looking (through his cell phone) at a 3d rendering of the data from the site (in Italy/Greece etc) and offering advice.

This is a practical tool that requires understanding the technical and



archaeological domains in order to work. Prior to attending UBC I was a technical program manager and I feel I could offer very practical guidance and support to any team willing to think this through from concept to design or even technical design.

Citation #1:

https://www.researchgate.net/publication/220141628_Handheld_Augmented_Reality_for_underground_infrastructure_visualization

Citation #2:

<https://dl.acm.org/citation.cfm?id=1527367>

Citation #3:

<https://www.roadtovr.com/utility-company-uses-augmented-reality-visualise-underground-infrastructure/>

Keyword #1:

digital, virtual reality, augmented reality, geophysics, 3d

Keyword #2:

archaeology, history, ancient, excavation, greece, rome, egypt, middle east, levant



Name:

Rana Jafari-Minab

Degree or Position:

Master's

Institution:

UBC

Department:

Pathology and Laboratory Medicine

Field of Research:

Epstein-Barr Virus and Multiple Sclerosis

Quick summary of your research (200 words max):

The proposed research project is focused on the possible role of Epstein-Barr virus (EBV) in MS. Since the likelihood of MS in the EBV negative population is exceedingly low, the possibility of vaccinating against EBV could prevent MS. We will be starting a prospective cohort study with university students as well to follow their acquisition of EBV/Infectious Mononucleosis and its impact on their immune system. If our hypothesis is correct, that selective EBV infection of CD21(hi) B cells producing natural antibodies cross-reactive to myelin is important in MS pathogenesis, then this vaccine has the potential to prevent MS.

Overall, my research includes techniques such as tissue culture, flow cytometry, PCR and fluorescent probing in order to see if EBV preferentially infects certain B cells in the body and whether this infection affects how the Natural Killer T cells (NKT) recognize these



infected B cells. Successful recognition of these B cells, if they do exist, will mean that potential vaccines can be used to target these sites and the chances of these patients developing MS in the future could be drastically diminished.

Summary of what you would like to do with your mentees (400 words max):

I would want to sit down with my mentees and see what they are really passionate about in research and then work from there. I believe good research takes place where passion lies and both the mentor and mentee have to be present and interested in their field. To me, immunology and virology are extremely interesting parts of research today so it would be great to be matched up with someone who also has those interests. I have experience in molecular and cellular biology as well so I can adapt to my mentees' interests if that is where they lie. Most importantly, I enjoy research that feels relevant and connected closely to patients in hospitals that are in need of new advancements to take place. I also find neuropsychology and socio-behavioural studies fascinating and am always interested in reading and finding out more about this field.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4689808/>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3170536/>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/16502434>

Keyword #1:

Autoimmunity

Medicine



Keyword #2:

Immunology



Name:

Dongsheng Xiao

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Department of Psychiatry

Field of Research:

Brain disorders, system neuroscience, machine learning

Quick summary of your research (200 words max):

Discovering spatiotemporal patterns in the brain activity associated with specific type of voluntary or involuntary motor acts.

I am a postdoctoral fellow in neuroscience, and I hold a MD-PhD with specialization in brain disorders. My research interests are in discovering brain circuits that underlie sensorimotor integration and motor functions. Understanding the neural basis of motor functions would help us find effective treatments for motor deficits, such as Stroke, Parkinson's disease and Huntington's disease.

One of the exciting directions in our lab is to develop cutting-edge neurophysiological techniques and instrumentation to probe the complex information flow in the brain during sensorimotor processing. We are also involved in cultivating artificial intelligence and computer vision to automate exploratory mining of our rich neural and video datasets. My current focus is to discover what spatiotemporal patterns in the brain

activity would be associated with a specific type of voluntary or involuntary motor acts. I investigate this with calcium imaging and electrophysiological recordings on the mouse model, which has offered us invaluable scientific insights into how the human brain works.

Summary of what you would like to do with your mentees (400 words max):

Undergrad students in our team will assist in observing and categorizing movement of the whiskers, facial muscles, and forelimbs of mice from recorded videos. We will then feed your manual categorization and our neural data (which is simultaneously recorded with the videos) into machine learning models to learn the dynamical neural patterns related to each prototypical movement.

While no wet-lab or computational experience is required, we would be happy to offer theoretical introductions to those. We will also encourage and facilitate publication of the participating students' research work at the UBC Medical Journal.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/28160463>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/27102043>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/28102925>

Keyword #1:

System Neuroscience

Keyword #2:

Machine Learning



Name:

Hanqi (Wayne) Zhao

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Pathology and Laboratory Medicine

Field of Research:

Transfusion medicine; blood component storage

Quick summary of your research (200 words max):

Platelet transfusion is a life-saving technique that has helped patients who are actively bleeding or undergoing chemotherapy. Currently, platelets are stored at room temperature have a storage life of just 5 days due to the risk of bacterial growth and decreased quality known as platelet storage lesion (PSL). This short storage life leads to platelet wastage and poses challenges for remote hospitals. My research goal is to investigate the possibility of storing platelets at refrigerated temperature. Several advantages of cold storage include reduced platelet metabolism, reduced risk of bacterial growth and extended platelet storage shelf life. Cold stored platelets also have been shown to be more beneficial to actively bleeding patients than room temperature stored platelets. The current challenge of using cold stored platelets is that they are quickly cleared from circulation upon transfusion. My current project aims to investigate the metabolomics of cold stored platelets to



discover new pathways and mechanism that can potentially improve cold stored platelet quality and increase their circulation time after transfusion.

Summary of what you would like to do with your mentees (400 words max):

Cold stored platelet is a relatively new field in transfusion. The mentees and I are going to be exploring this new field together. The project that we are likely going to work on is going to on the metabolism of cold stored platelets compared to room temperature stored platelets. During the project, the mentees will learn to analyze platelet physiology using clinical instruments such as ROTEM, blood gas analyzer and Sysmex hematology analyzer. We may also have a chance to work with our collaborators in Seattle who is an expert on metabolomics analysis. I would also ask them to generate their own hypothesis and make a proposal for potential experiment. I would like this project to be interactive rather than instructive so that we can learn from each other. The project will be at its very early stage by the time the program starts so there will be plenty of time for the mentees to get used to laboratory techniques and read upon literature background of the project.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/30037501>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/20513565>

Citation #3:

nan

Keyword #1:

Medicine



Transfusion, blood research

Keyword #2:

cold storage, platelet, metabolomics

Forestry



Name:

Guillaume Peterson

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Forest Resources Management

Field of Research:

Climate change

Quick summary of your research (200 words max):

Guillaume Peterson St-Laurent is a postdoctoral fellow in the Department of Forest Resources Management and member of the Social-Ecological Systems Research Group. Multidisciplinary by training, Guillaume's research falls at the intersection between natural and social sciences. His broad research interests bring together natural resource management, territorial governance, environmental policies, deliberative-analytical engagement processes, climate change mitigation and adaptation and the socio-economic and environmental impacts of the extractive industries.

Guillaume would be happy to supervise projects that are broadly related with policy and governance issues associated with natural resource management. While my main research focuses on forest management, I am also interested in other environmental sectors (e.g., mining, oil and gas, renewable energy). I also have a keen interest for public and stakeholder



participation and engagement in decision-making around environmental problems and policy.

Summary of what you would like to do with your mentees (400 words max):

Forests play important roles in regulating climates. The way we manage the world's forests and harvested wood products offers substantial opportunities to mitigate climate change by reducing greenhouse gases (GHG) emissions and increasing carbon removals from the atmosphere. However, forests are also being increasingly affected by the impacts of climate change. Climate change has been associated with greater frequency and acuteness of natural disturbances such as droughts, wildfires and insect outbreaks. Changes in climate are also expected to change future distribution and range of tree species. In response experts and decision makers are considering the design and implementation of forest management strategies that aim to reinforce natural resilience of forests to disturbance and increase their adaptability to climate change. Climate change mitigation and adaptation strategies and policies have usually been treated separately while addressing climate change both in general and in the forest sector. However, adaptation and mitigation strategies can interact with each other in a variety of ways. On the one hand, attempts at mitigating climate change can lead to positive impacts on adaptation, and adaptation strategies can have positive effects on mitigation. For instance, old growth forest conservation, particularly in the tropics, provides considerable climate change mitigation benefits that can also increase forest resilience due to their greater biodiversity compared to

monocultures. On the other hand, adaptation and mitigation policies can also have negative impacts on one another. The implementation of short rotation in industrial plantations can in some contexts represent an adaptation strategy that can lead to decreased carbon sequestration.

In recent years increasing efforts have been directed towards the incorporation of both adaptation and mitigation in actions and strategies aimed at addressing climate change in the forests. Not only are both climate actions often compatible, but they also sometimes display synergies so that their combined effect is greater than the sum of their effects if implemented separately. However, while there is potential and opportunities associated with integrating adaptation and mitigation, very few initiatives and policies have been successful in practice. I would suggest that in this research project students could use the case study of the Canadian province of British Columbia, to explore two related research questions: (1) How well are the design and implementation of climate adaptation and mitigation policies integrated for BC's forests? And (2) What are the challenges and opportunities for better integration of climate adaptation and mitigation policy design and implementation in BC forests? This could be done through a combination of literature review, policy analysis and interviews with government officials and practitioners.

Citation #1:

450. <http://doi.org/10.3390/f2010431>

Citation #2:

<https://onlinelibrary.wiley.com/doi/abs/10.1002/wcc.357>

Forestry



Citation #3:

<http://doi.org/10.1016/j.envsci.2016.11.004>

Keyword #1:

Forest management

Keyword #2:

Climate change

Name:

Miling Li

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Earth, Ocean, and Atmospheric Sciences

Field of Research:

Environmental Sciences, Isotope geochemistry

Quick summary of your research (200 words max):

I am a postdoctoral fellow in the Department of Earth, Ocean, and Atmospheric Sciences at UBC. My research interests lie in GeoHealth—the rapidly emerging multidisciplinary field that connects earth and environmental sciences with ecosystems and human health. I obtained my doctoral degree in Environmental Health from Harvard University and my dissertation focused on developing novel methods for tracking sources of methylmercury—a neurotoxin in humans and wildlife.

At UBC, I develop and apply geochemical tools (e.g., traditional and non-traditional isotopes) to investigate the sources of aquatic pollutants and to understand the ecological habitats of fish and marine mammals. Specific research projects include studying (1) migration history of different Pacific salmon stocks; (2) how climate change affects the Arctic food web structure and dynamics.

Summary of what you would like to do with your mentees (400 words max):



To mentees: I am fairly open to projects looking at how environmental changes could affect the biogeochemical cycling of contaminants, which would ultimately influence human health by changing the contaminant burden and nutritional quality of seafood. I also highly encourage students with strong interests in environmental issues in aquatic/marine ecosystems to bring their ideas to me! Some quantitative skills like spatial analysis (e.g., GIS) or statistical or mathematical modeling or coursework/analytical experience in geochemistry will be preferred but not required.

Citation #1:

<https://ehp.niehs.nih.gov/EHP2644/>

Citation #2:

<https://pubs.acs.org/doi/abs/10.1021/es500340r>

Citation #3:

<https://pubs.acs.org/doi/abs/10.1021/acs.est.6b03206>

Keyword #1:

Environmental contaminants

Keyword #2:

Aquatic ecosystems, Marine environments.

Education



Name:

Silvia Mazabel/Nikki Yee/Ben Dantzer

Degree or Position:

Ph.D.

Institution:

UBC

Department:

ECPS

Field of Research:

Self-regulation for Learning

Quick summary of your research (200 words max):

When teachers are asked to describe what causes children to fail in their classrooms, they often mention problems paying attention, following directions, working well with others, coping with challenges, and adapting to complex environments. These skills are associated with self-regulation.

People who struggle with self-regulation may find it hard to feel successful at learning and connected to school and their communities.

Research shows that self-regulation is malleable and that academic/non-academic contexts are important to the effective learning, engagement, and motivation of students. Our research examines ways to:

- (a) support children development of self-regulation for learning (SRL);
- (b) Help teachers to support SRL in their classrooms.

We use participatory frameworks in which teachers and researchers collaborate to identify goals and actions that meet their needs and ways in which they can enhance their teaching practice. As a result, we



exchange knowledge whereby teachers receive guided and sustained support around SRL, and researchers have opportunities to test theories and learn “what works” in “real life” laboratories.

We work together in Dr. Nancy Perry’s research group and are currently focused on a longitudinal study of children’s development of SRL ((Kindergarten to Grade 6). This year, we’ll have students in Grade 5.

Summary of what you would like to do with your mentees (400 words max):

What would we like to do with mentees?

There are many aspects of self-regulation and self-determination for learning that students can focus their research on. The three primary mentors for this project have the following research interests:

Silvia (PhD candidate in Special Education) is interested in ways in which post-secondary instructors can integrate supports for deliberate, strategic and reflective learning (aka as SRL) in their undergraduate courses.

Nikki (PhD candidate in Special Education) looks at how non-Indigenous (and all) teachers can best support Indigenous (and all) students in diverse classrooms, and how SRL promoting strategies can provide an entrance into that process.

Ben (PhD student in Human Development, Learning, and Culture) explores how

Education



classrooms, relationships, and communities can be constructed to support people's feelings of autonomy, belonging, and competence - often referred to as the three "basic psychological needs" within Self-Determination Theory.

For the purposes of this project we will focus our work around connections with the Longitudinal Study. This will give you an opportunity to experience first hand how a research group works in planning and implementing educational research.

We encourage you to choose any topic of your interest in relation to the Longitudinal Study, for example:

- How do socio-cultural contexts influence self-regulated learning?
- What contexts and educational practices support self-regulated learning?
- How does children's self-regulated learning (metacognition, motivation, and strategic action) change from Kindergarten to Grade 6?
- How does socially shared regulation support learning? And how does it change over time?

You don't have to choose any of these questions. We will work with you to co-construct a question that will be of interest and relevance to you. We are excited to hear about your ideas and perspectives, and look forward to hearing from you!

Citation #1:

Perry, N. E., & VandeKamp, K. O. (2000). Creating classroom contexts that support young children's development of self-regulated learning. *International Journal of Educational Research*, 33, 821-843. doi: 10.1016/S0883-0355(00)00052-5

Citation #2:

Greene, J. (2018). *Self-Regulation in Education*. New York: Routledge. (<http://resolve.library.ubc.ca/cgi-bin/catsearch?bid=9118962>)

Citation #3:

Ryan, R. M., & Deci, E. L. (2017). Self-determination theory: An introduction and overview. In *Self-determination theory: Basic psychological needs in motivation, development, and wellness* (pp. 3-28). New York: Guilford Publishing. (<http://resolve.library.ubc.ca/cgi-bin/catsearch?bid=8678742>)

Keyword #1:

Self-regulation for learning

Keyword #2:

classroom-based research

Name:

Cecilia Campero

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

School of Public Policy and Global Affairs

Field of Research:

Water governance/ markets and extractive industries

Quick summary of your research (200 words max):

We live in times marked by water crisis. Waking up with news about cities running out of water is becoming a regular event nowadays. In a perfect world, technological solutions, such as desalination, will help water-constrained environments. Nevertheless, more than simply augmenting supply sources, desalination is imbricated in a more fundamental reconfiguration of nature-society relations.

How does desalination reconfigure nature-society relations? Desalination creates new water markets where the resource is treated as a commodity (production of pre-agreed quantities and specified physical characteristics of water), similar to mineral resources. Additionally, desalination produces new socio-environmental impacts and risks in societies (e.g. distributional implications and inequalities). Finally, but no less important, desalination technology is inserted into a new and undefined ground in terms of legal characteristics, institutional and

political processes.

Working as a Post Doctoral Research Fellow at the School of Public Policy and Global Affairs, I draw my research on extractive industries using desalination (especially the mining sector) and I have found that desalination enhances possibilities for industry expansion, not only affecting other water and environmental conditions, but also reordering water flows (water flows from the sea to communities, rather than to industries).

Summary of what you would like to do with your mentees (400 words max):

My research explores how power relations produce, un-produce and re-produce socio-environmental changes in mining territories. I am currently building my work on critical literature on desalination. This research has acknowledged that this technology is changing hydro-social dynamics (e.g. water diversions, water markets and water governance) and interesting work has been drawing on the discursive dimensions of the political characteristics of desalination (proposed as a “fix” to the different scalar relations of water and facilitating the technology coupling with infrastructure that can enhance its profitability).

My research attempts to contribute to critical work on desalination by using two principal theoretical approaches, which I would encourage mentees to explore in their research projects:

- 1) Existing research in the mining sector is documenting how water is co-produced by the mining industry and is reconfiguring hydro-social relations, but doesn’t include how desalination can influence governance

arrangements in hydrological regimes.

This analysis contributes to the emerging critical literature on desalinated water by expanding analysis to include implications for the mining industry which is acting as a user and water supplier to urban centers.

2) Existing research in legal geography is documenting how water resources/water management are impacted by discursive constructions embedded in and enacted by legal institutions and legal processes. Notably, despite the traction of climate change in legal geography, desalination or seawater is not included.

This analysis contributes to the emerging critical literature on desalinated water by expanding analysis to include legal processes to better capture discourses and the network of actors sustaining them. Water conflicts under the legal process view can be useful in unpacking discourses sustaining desalination and the new techno-political characteristics.

Based on literature review, we will draft research questions and highlight our empirical/methodological contribution to the literature. Some of my methods, which I include in my research, are Geographical Information Systems (GIS) and social network analysis, but I am fairly open to new approaches.

I welcome enquiries from prospective Mentees with interests in one or more of the following: political ecology, extractive industries, desalination,



water markets/governance, interdisciplinary social-natural science, environmental policy, Latin America and local government.

Citation #1:

<https://www.sciencedirect.com/science/article/pii/S0016718518301313>

Citation #2:

<http://www.water-alternatives.org/index.php/volume5/v5issue1/161-a5-1-8/file>

Citation #3:

<https://www.sciencedirect.com/science/article/pii/S0016718511001722>

Keyword #1:

Water governance

Keyword #2:

Extractive industries



Name:

Sarah Crosby

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Mechanical Engineering

Field of Research:

Buildings and Ventilation

Quick summary of your research (200 words max):

I generally work in the field of build environment and buildings energy and ventilation. I am in my 2nd year of my PhD. During my first year, I was leading a project that aimed to assess the ventilation effectiveness of pilot house on campus. I conducted multiple tracer gas experiments as long as thermal comfort and air tightness assessment of the house. Currently, I am doing a project on developing the current thermal comfort model to include non-thermal factors using Bayesian Statistics approach.

Summary of what you would like to do with your mentees (400 words max):

I will be happy to help in any research related to ventilation, buildings, thermal comfort, Bayesian statistics, HVAC, and building energy modelling.

Citation #1:

<https://open.library.ubc.ca/cIRcle/collections/graduateresearch/42591/items/1.0366211>

Citation #2:



<https://www.sciencedirect.com/science/article/pii/S0360132313002151>

Citation #3:

<https://www.sciencedirect.com/science/article/pii/S0360132308000693>

Keyword #1:

building energy modelling, ventilation, HVAC

Keyword #2:

Thermal comfort, Bayesian Statistics



Name:

Marie Paul Nisingizwe

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Population and Public Health

Field of Research:

Health services and policy research

Quick summary of your research (200 words max):

My research project will be evaluating the mass screening and treatment program for hepatitis C virus (HCV) implemented in Rwanda. I will describe the cascade of care for HCV patients and identify factors that influence patients to drop out of care before treatment completion. Cascade of care happens between diagnosis and clearance of HCV in patients' blood. Between these two stages, HCV patients have to go through additional stages including confirmatory testing, staging disease, therapy initiation, and therapy completion. The study seeks to monitor this trajectory and investigate the reason for dropping out at different stages. Further, the study will examine the impact of the program on the number of patients tested and initiated treatment. I will also evaluate whether mass screening strategy is a cost-effective strategy compared to the strategy of routine screening at health facilities. Some of the statistical methods that will be used include interrupted time series.



Interrupted time series allows the researcher to assess over time changes in the outcome of interest comparing before and after program implementation. I will also use Markov models which allow us to model disease progression and inform decision-makers about the cost-effective strategy for HCV treatment.

Summary of what you would like to do with your mentees (400 words max):

I am currently flexible with any projects that are health-related and mentees are welcome to bring to me any ideas that are of interest to them. I am more interested in research projects that are linked to policy evaluation or assessing patients' outcomes or assessing the gap in the delivery of health services. I have a strong background in epidemiological study designs and other quantitative methods that are useful in health policy evaluation. I have been a research mentor before for two years and what I found helpful was to allow mentees to come up with their research ideas and help them to develop research questions from their interests. The first phase of the question identification process is usually to identify broad topics that are a high priority for the mentees. In some cases, the mentees might already have an area of interest that can be used as a starting point for understanding where evidence needs exist. Specific research questions can then be sought through a review of the literature on the topic. After conducting the literature review, we then refine the research question and start developing the study design. The literature review is an essential part of the research process, and I will be able to provide my mentees with useful tips on how to conduct a literature review



and avoid plagiarism. The last step after study design would be to carry out the analysis and start manuscript development. If needed, I can share other resources that will help you to advance your knowledge on the topic, the research design and analysis methods. I welcome mentees who are willing to improve their skills in medical research. Your experience will be awesome!

Citation #1:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4320005/pdf/nihms640929.pdf>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5078584/pdf/main.pdf>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5407170/>

Keyword #1:

Health services

Keyword #2:

Access to healthcare

**Name:**

Brittany Jane Carr

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Ophthalmology and Visual Sciences

Field of Research:

Myopia, Retinal Degeneration

Quick summary of your research (200 words max):

My doctoral research focussed on identifying potential mechanisms underlying inhibition of myopia (near-sightedness) by atropine – a drug that is best known to block muscarinic acetylcholine receptors. We do not know how atropine inhibits myopia, so we cannot develop more effective therapies. I presented pharmacological evidence that myopia inhibition may occur through β -adrenoceptors, instead of mAChRs. I also presented evidence that nitric oxide, a neuromodulator, plays an important role in regulation of eye growth and myopia inhibition by atropine in the chick form-deprivation model.

My postdoctoral studies are focussed on using CRISPR/Cas9-mediated genetic modification to replicate human retinal mutations in the African clawed frog model organism, to determine possible mechanisms through which they may cause retinal degeneration. My genes of interest are prominin-1 and



photoreceptor cadherin, which cause cone-rod dystrophy, macular degeneration, and retinitis pigmentosa. We use confocal, super-resolution, and electron microscopy to assess the effects of these mutations on photoreceptor structure.

Methods and literature that I am comfortable with for undertaking a REX mentorship are:

- Immunohistochemistry and Imaging
- Pharmacology
- CRISPR/Cas9-mediated gene knock-down
- Retinal degenerative diseases
- Refractive disorders (myopia, hyperopia)

****IMPORTANT NOTE:** I am based at the UBC/VGH Eye Care Centre, not UBC main campus**

Summary of what you would like to do with your mentees (400 words max):

Theoretical research projects could entail:

- Investigating possible downstream signalling effectors of myopia inhibition
 - o Dopamine, nitric oxide, growth factors
- Investigating non-mAChR drugs
- Investigating dual-injection experiments (drug + blocker, additive drugs)
- Investigating non-specific/unknown binding partners of drugs



- Investigating the effect of light on refractive development
- Localizing retinal proteins that may be involved in refractive development
- Investigating the retinal circuitry underlying refractive disorders
- Investigating any gene of interest that may cause retinal degeneration or a vision disorder
 - o What happens when you knock out that gene?
- Localizing retinal proteins of interest
- Combining different mutations
- Gain-of-function experiments
- Using CRISPR/Cas9 and homology-directed repair to correct genetic mutations
- PCR optimization, genotyping mutant animals

Project ideas could be simple (what does this drug do to eye growth) or more complex (what are possible underlying mechanisms of drug effects, how do genes interact to cause photoreceptor degeneration). I will be unable to support experiments for these projects in their entirety. Possibly, I will be able to teach students how to do PCR, immunohistochemistry and imaging under my direct supervision (to be discussed, project-dependent).

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/29266913>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/27260426>

Medicine



Citation #3:

nan

Keyword #1:

Retina/Degeneration/Refractive Error

Keyword #2:

Immunohistochemistry/molecular biology/pharmacology



Name:

Sameer Desai

Degree or Position:

Ph.D.

Institution:

UBC

Department:

School of Population and Public Health

Field of Research:

Population Health

Quick summary of your research (200 words max):

I am interested in improving the health of populations and patient outcomes through quantitative research designs. Specifically, I am studying the disease cystic fibrosis by using population-based patient data and statistical tools to answer critical research questions that can impact patient's lives in a positive way, founded on evidence-based information. The ultimate goal is to guide enhance their health and well-being so they can live the best life possible.

Summary of what you would like to do with your mentees (400 words max):

A population health perspective is applicable to any population so I would want my mentees to study something that relates to them. May be undergraduate health? What type of stress levels do these students face? How are their diets affected upon entering a school year versus before? Their physical health? Substance abuse?

Citation #1:

Adam Erickson, Marissa Becker, Souradet Shaw, Ken Kasper & Yoav Keynan (2015) Substance use and its impact on care outcomes among HIV-infected individuals in Manitoba, *AIDS Care*, 27:9, 1168-1173, DOI: 10.1080/09540121.2015.1035634

Citation #2:

Experiences of chronic stress and mental health concerns among urban Indigenous women

Citation #3:

Desai, S., Wong, H., Sykes, J., Stephenson, A. L., Singer, J., & Quon, B. S. (2018). Clinical Characteristics and Predictors of Reduced Survival for Adult-Diagnosed Cystic Fibrosis: Analysis of the Canadian CF Registry. *Annals of the American Thoracic Society*, (ja).

Keyword #1:

health/health science

Keyword #2:

biostatistics



Name:

Ataollah Kheyrandish

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Chemical and Biological engineering

Field of Research:

Advanced Oxidation Processes

Quick summary of your research (200 words max):

Application of ultraviolet (UV) radiation for water treatment has been increasing steadily in the past two decades. Further, significant improvements in semiconductor technology have made ultraviolet light emitting diodes (UV-LEDs) a viable alternative to conventional UV sources for water treatment. However, utilizing UV-LEDs for water disinfection comes with challenges related to their radiation measurements due to their specific structure, operation, and radiation pattern. Without a standardized measurement method, the efficacy of this new radiation source on the inactivation of waterborne microorganisms could not be determined accurately.

In my study, in order to determine the fluence delivered to a microorganism's solution, first, a method was developed to properly operate, control, and measure the output of the UV-LEDs. Then, the radiation distribution was simulated. The radiation model was validated by

two common measurement techniques, chemical actinometry, and radiometry. Subsequently, the radiation model and the operational method were implemented to develop a protocol for fluence determination of UVLED systems. Finally, the developed fluence determination protocol was tested in different setups to evaluate the radiation distribution and its effect on microbial inactivation kinetics measurements.

Summary of what you would like to do with your mentees (400 words max):

We want to investigate more on the application of emerging ultraviolet light sources on, not only water disinfection, but also to remove harmful micropollutant like pharmaceutical residue from water. UV-LEDs are very small ultraviolet light sources which limited manufacturers use them for water treatment application. there is a broad range of project we can define on them depends on the group skills.

Citation #1:

<https://doi.org/10.1016/j.watres.2017.06.015>

Citation #2:

<https://doi.org/10.1016/j.jphotochem.2017.10.047>

Citation #3:

nan

Keyword #1:

UV-LED

Keyword #2:

ultraviolet water treatment



Name:

Marcus Prasad

Degree or Position:

Master's

Institution:

UBC

Department:

Art History, Visual Art and Theory

Field of Research:

Visual, social, and spatial politics

Quick summary of your research (200 words max):

My research focuses on the interdisciplinary nature of art historical inquiry, targeting the intersections of and between visual art, architecture, and film. While these disciplines maintain their own exclusive methodologies, I am specifically interested in the ways in which art historical theories of social and philosophical analysis can help us better understand the current and potential role of art, architecture, and film in our society. My methodology requires that cultural artefacts like paintings, buildings, and movies are to be seen as products or symptoms of their respective socio-political climate. As such, my research aims to investigate the temporal and spatial dynamics through the application of social theory, urban theory, and the aesthetics of film in order to uncover political imperatives and potentialities within such cultural formations.

Summary of what you would like to do with your mentees (400 words max):



Given that my research is interdisciplinary and not exclusive to one specific object of analysis, I am open to working on research projects that involve any investigation of art, architecture, or film. While interdisciplinarity can be daunting and often times slimly defined, I encourage any students with a strong interest in the study of art, its analytical framework, and how we can apply such approaches to other disciplines or fields of research in the humanities to bring their ideas to my group! My suggestion for the beginning of a research project would be to select a work (perhaps a painting, sculpture, film, or work of architecture) and to research not only the work exclusively, but the subjectivities created within the space of the work. For example, a movie creates a specific kind of space on screen that allows viewers to detach themselves from their own reality for a certain amount of time. A work of public architecture controls the flow and behaviour of people within it based on its physical construction. And similarly, a work of art inside a gallery or museum responds to its spatial surroundings in a calculated and/or particular manner. With this examination of the spatial politics of cultural products, I imagine that research questions will emerge from a different angle than traditionally conceived within each respective discipline. A methodology can then be devised with a critical application of spatial/social theorists in order to ground our analytical framework in established research, while still inserting our own ideas in a supported and confident way.

Citation #1:



<http://dm.ncl.ac.uk/courseblog/files/2011/03/michel-foucault-panopticism.pdf>

Citation #2:

http://www.laits.utexas.edu/berlin/pdf/scholarship/De%20Certeau_Walking.pdf

Citation #3:

<https://doubleoperative.files.wordpress.com/2009/12/las-meninas.pdf>

Keyword #1:

Art history

Keyword #2:

Social theory

Education



Name:

Lauren Currie

Degree or Position:

Master's

Institution:

UBC

Department:

Counselling Psychology

Field of Research:

Forensic Psychology, Substance Use, Reintegration

Quick summary of your research (200 words max):

I am a master's student with interests in the areas of forensic psychology, substance use, and reintegration. My thesis will be a psychometric evaluation of a measure of hope related to career with a substance abuse population. I have also been involved in research conducted on topics such as risk assessment, NCRMD, malingering, jury decision-making, gruesome evidence, guilt and remorse, lie detection, and services for rural/remote female young offenders. My research interests remain broad within this field. However, I believe I can provide some guidance in this area and look forward to working with a small team of researchers to develop an interesting and novel research project.

Summary of what you would like to do with your mentees (400 words max):

I am open to any projects in the area of forensic psychology. I am also willing to providing some research ideas on different topics and projects. Currently, I am interested in projects related to jury member stress



and/or PTSD as a result of serving on a jury. The impact of gruesome evidence on jury members has been found to impact jury decision-making and cause lasting harm to jury members. However, relatively little research has been conducted in this area.

I have experience with both qualitative and quantitative methodologies and would be open to developing a proposal utilizing either methodology. Once determining what we would like to investigate I will provide some reading in the area and help guide a strong literature review. I would like the group to work collaboratively to develop research questions, methodology, proposed analyses, and predicted study results.

Citation #1:

<https://www-sciencedirect-com.ezproxy.library.ubc.ca/science/article/pii/S004723521630054X>

Citation #2:

<https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1468-2311.2008.00539.x>

Citation #3:

nan

Keyword #1:

Jury Member Stress

Keyword #2:

Evidence



Name:

Hyunwoo Lee

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Neurology

Field of Research:

Neuroscience, Neurology, Neuroimaging

Quick summary of your research (200 words max):

Neurological disorders, such as multiple sclerosis and Alzheimer's disease, cause progressive nerve cell death in the brain. Such destructive pathological processes are often seen from the earliest stages of the disease and may lead to irreversible neurological, cognitive, and physical impairment in the future. If we can understand how the structural and functional changes propagate in the patients, we may be able to use the findings to predict the patterns that are associated with specific types of the diseases. One way to measure these changes is to use neuroimaging tools, such as magnetic resonance imaging (MRI) scans of the patients. For example, people potentially at risk of developing neurological disorder in the future may suffer a greater degree of neurodegeneration in comparison to healthy people. This could show as areas of significantly reduced brain volume in specific areas of the brain.

Summary of what you would like to do with your mentees (400 words max):



Neuroimaging is an umbrella term for a number of techniques that directly or indirectly produce images of the brain. Each technique is designed to convey distinct types of information, depending on the question that a researcher wants to ask.

For example, structural imaging (such as structural magnetic resonance imaging) allows us to visualize static images that contain anatomical information. One can use structural MRI to measure, for example, how the shapes of hippocampus in people with dementia differ from those of healthy individuals.

Functional imaging (such as functional magnetic resonance imaging) allows us to visualize the dynamic relationship between activity in certain brain areas and specific neurological functions. For example, while doing motor-related tasks, people with multiple sclerosis may recruit brain regions that are not typically active in healthy individuals.

We will design a *theoretical* research project that involves using neuroimaging tools to study neurological disorders. First, students will choose a neurological disorder of their choice (Alzheimer’s disease, frontotemporal dementia, multiple sclerosis, Parkinson’s disease, etc.) and do some background readings on the topic. This will allow the students to review the current status of our understanding of the disease.



Second, the students will then come up with a research question. This could be on any topic that the students are interested in. For example, the efficacy of a theoretical new drug on progression of neurodegeneration in Alzheimer’s disease; characterization of potential gender-related differences in progression of multiple sclerosis; using big MRI data and machine learning to automatically and efficiently identify the people who may develop dementia in the future; evaluating whether the people who score poorly in cognitive tests have altered brain structures or functions compared to healthy people; to name a few.

Third, the students will design appropriate methodologies to answer their research questions. This will involve selection and application of the tools that can measure the effects of interest, selection of the statistical methods that are suitable for their data, and analysis/interpretation of the results. This part will allow the students to be familiarized with the commonly used research methodologies.

Note that the results will not be simply made up. The students will review previous studies and compare their results to the existing literature. Their “findings” may or may not be in line with previous findings, and the students will discuss the potential reasons.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/26827786>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/18548064>

Medicine



Citation #3:

nan

Keyword #1:

Neuroscience

Keyword #2:

Neuroimaging



Name:

Jenna Treissman

Degree or Position:

Master's

Institution:

UBC

Department:

Obstetrics and Gynaecology

Field of Research:

Early development of the placenta

Quick summary of your research (200 words max):

Successful pregnancy depends on proper development of the placenta, a fetal-derived organ that controls nutrient and oxygen exchange between mother and fetus. Specialized cells, called trophoblasts, coordinate these processes. In early placenta development, trophoblasts adopt invasive characteristics that facilitate the physical anchoring of the placenta to the mother's uterus. Defects in proper placenta anchoring are associated with spontaneous miscarriage and poor pregnancy outcomes including preterm birth and the birth of small babies. Importantly, the concentration of oxygen in the placenta is thought to be important in controlling cellular processes of placenta development. Therefore, the goal of my master's research is to study how low, moderate and high levels of oxygen control trophoblast-directed placenta anchoring. To do this, I use a unique tissue culture system that mimics the biological environment of a pregnant woman's uterus and allows for manipulation of oxygen conditions. Using



state-of-the-art imaging and gene analysis techniques, I am working to identify and test the importance of gene pathways that are altered by various oxygen conditions. This work will be important for shedding new insight into the early cellular and molecular processes that are directly involved in establishing a healthy pregnancy and controlling health outcomes for mother and child.

Summary of what you would like to do with your mentees (400 words max):

I would like to mentor students that are interested in pursuing a project in any area of reproductive and developmental sciences. My graduate research is focused entirely on early placental development. I use lab-based tissue culture and bioinformatic approaches to investigate this topic. However, my undergraduate research was an epidemiological study looking at sexual health and fertility. Therefore, I have experience with and am prepared to mentor students on both basic science and epidemiological projects in reproductive and developmental health. Topics of particular interest to me include male and female infertility, pregnancy complications (ex: pre-eclampsia, preterm birth and still birth), medically assisted reproduction, breastfeeding and postpartum depression.

I would like each of my students to start their projects with a systematic literature review. Literature review is an important skill to develop; it will allow us to gain knowledge of the field and find gaps in the research that need to be filled. Students should think about the originality,



feasibility and potential impact of their research. We will explore various qualitative and quantitative methods in human biology and/or epidemiological research. They will write a project proposal outlining the specific aims of their research, a theoretical budget, and timeline for completion.

My lab is equipped with a biological safety cabinet, centrifuge, fume hood, dissecting microscopes, incubator and digital microscopy camera. We may be able to do a tissue-culture based project looking at placenta cells or other biological samples. We can conduct epidemiological studies with surveys, focus groups, or questionnaires and practice pilot-testing our methods.

I have many of my own ideas to bring forward, but I am also very flexible and I look forward to hearing about the students' ideas for research projects they would like to pursue in the area of reproductive and developmental health.

Citation #1:

<https://www.sciencedirect.com/science/article/pii/S152169341000132X?via%3Dihub>

Citation #2:

[https://www.placentajournal.org/article/S0143-4004\(17\)30143-1/fulltext](https://www.placentajournal.org/article/S0143-4004(17)30143-1/fulltext)

Citation #3:

<https://www.tandfonline.com/doi/abs/10.4161/cc.5.5.2497>

Keyword #1:



<https://www.sciencedirect.com/science/article/pii/S016503781300065X?via%3Dihub>

Keyword #2:

trophoblast, placenta, oxygen, hypoxia, pregnancy, maternal health, reproduction, development



Name:

Nicola Anderson

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Psychology

Field of Research:

Eye tracking; Attention; Eye movements

Quick summary of your research (200 words max):

My research focuses on tracking the eyes (and the attention) of people. What people look at says a lot about what they're thinking and feeling. I study how people look at their environment doing everyday tasks, looking at pictures, and in virtual and augmented reality. My most recent line of work focusses on understanding how people orient their attention in VR. VR gives us absolute control over our experimental design, and of particular interest to me, allows us to track both the head and the eyes, simultaneously. We are no longer constrained to studying eye movement behaviour on a single computer monitor – we can now do it with very high resolution and in a 3D environment! Currently we are working on simple experiments programmed in Unity, and exploring ways to analyze this more complex head and eye data. I am also interested in tracking the eyes of people as they go about their daily lives, using specialized mobile eye tracking hardware.



Summary of what you would like to do with your mentees (400 words max):

With my mentees, I'd be happy to do a couple of different projects: 1) We can expand on some of the projects already underway in the lab using the VR equipment. For example, in one project, I am rotating stimuli (or the entire environment) in VR and looking at how this impacts how the participant moves their head and eyes. If the horizon is rotated 45 degrees, do participants compensate by rotating their heads also? If so, is this functional in eye movement control? 2) I am looking for help with a long-term eye tracking project. With new technology capable of recording eye movements over a longer period of time, I would like to explore how attention is distributed while people go about their daily lives.

The timelines for either of these lines of work is roughly a semester (or more, depending on the complexity of the project). The VR work requires some technical experience (as the studies are programmed in Unity using C#).

Citation #1:

<https://www.sciencedirect.com/science/article/pii/S0042698910000416>

Citation #2:

<http://rsos.royalsocietypublishing.org/content/4/1/160569>

Citation #3:

<https://www.sciencedirect.com/science/article/pii/S1364661305000598>

Keyword #1:

Psychology

Keyword #2:

Attention

Forestry



Name:

Laura

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Forest and Conservation Sciences

Field of Research:

Ecology

Quick summary of your research (200 words max):

For my PhD, I am studying how humans are impacting plant-microbe-invertebrate interactions. My research is field-based as well as on campus (lab, greenhouse/growth chamber), and on the computer.

Summary of what you would like to do with your mentees (400 words max):

Student projects related to soil food webs and microscopy work are particularly welcome, but I am flexible; it is key that students are passionate about the topic they choose, even if it is tangentially related to my work. My research has community ecology, invertebrate zoology, fungal biology, botany, and plant symbioses research components, so students interested in these areas will likely get the most out of a mentorship. I am also mentoring undergraduate students (in general biology, microbiology, forestry, etc.) who are not in REX URO, and mentees from the REX program are welcome to join these volunteers and paid researchers in other activities. Right now I am doing analyses of



molecular work and exploring statistical analyses, and can discuss ideas with students if they are interested in theory and practical concepts related to molecular biology and statistics. I am very interested in both research and teaching, as well as their integration (e.g., teaching research concepts and scientific process through mentoring).

As part of my UBC teaching certificate program (completed in 2017), I explored how to improve science literacy at UBC and off campus: <http://ctlt.ubc.ca/programs/all-our-programs/graduate-program-in-advanced-teaching-and-learning/>

I have mentored for REX URO before, and find it rewarding for all students involved. One of the REX students is planning on doing a directed studies with me and my supervisor. What you put into REX (as most things in life) is what you get out of it!

Related videos:

Dr. Suzanne Simard [â€” TED Talk: https://www.ted.com/talks/suzanne_simard_how_trees_talk_to_each_other](https://www.ted.com/talks/suzanne_simard_how_trees_talk_to_each_other)

Dr. Elaine Ingham [â€” Soil Food Web video: https://vimeo.com/21689321](https://vimeo.com/21689321)

Healing Forests [â€” UBC TerreWEB:](https://www.ubc.ca/terreweb/)



<https://www.youtube.com/watch?v=LjPIsGYTd40>

Citation #1:

<http://www.ncbi.nlm.nih.gov/pubmed/21613143>

Citation #2:

<http://onlinelibrary.wiley.com/doi/10.1111/j.1461-0248.2008.01250.x/abstract>

Citation #3:

<http://onlinelibrary.wiley.com/doi/10.1111/nph.13679/full>

Keyword #1:

Ecology

Keyword #2:

Plant-microbe-invertebrate interactions



Name:

Alireza Golnaraghi

Degree or Position:

Visiting Researcher (Assistant Prof.)

Institution:

UBC

Department:

Department of Earth, Ocean and Atmosphere Sciences

Field of Research:

1- Identification of viruses infecting plants, fungi and algae in terrestrial and aquatic ecosystems, and their evolution; 2- Study on plant microbial communities

Quick summary of your research (200 words max):

Now, I am studying on viruses infecting unicellular algae (UBC); however, my PhD students also are working on plant endophytic microbial communities and their associated viruses.

Summary of what you would like to do with your mentees (400 words max):

Identification of viruses infecting plants, fungi and algae in terrestrial and aquatic ecosystems

2. Study on plant microbial communities

Citation #1:

Viruses of microorganisms. 2018. Caister Academic Press.

Citation #2:

Diversity and Benefits of Microorganisms from the Tropics. 2017. Springer International Publishing AG

Citation #3:

4. Yasaka, R., Fukagawa, H., Ikematsu, M., Soda, H., Korkmaz, S., Golnaraghi, A., Katis, N., Ho, S., Gibbs, A., and Ohshima, K. 2017. The timescale of emergence and spread of Turnip mosaic potyvirus. *Scientific Reports* 7: 4240.

Keyword #1:

Plant Endophytic Microbial Communities

Keyword #2:

Viruses of Algae

Land and Food Systems



Name:

Elaine Cheng

Degree or Position:

Master's

Institution:

UBC

Department:

Food Science

Field of Research:

Food Science

Quick summary of your research (200 words max):

Wine fermented by commercial yeast inoculation is a common practice in the Okanagan Valley. In recent years, however, multiple studies have suggested that native yeasts and grapes within specific geographical sites may provide a distinctive aroma profile for the resulting wine. Particularly, wine yeasts varied in strain-level have shown complexed yet unique metabolic interactions which differentially impact the sensory perspective of wine. Therefore, my project focuses on surveying wine yeast across three sub-regions of the Okanagan Valley along with a chemical analysis on the wine grapes in 2017. This required a characterization of approximately 1,600 wine yeast strains using fingerprinting techniques. Also, an analysis of tannins and anthocyanins contents of over 2,000 berries will be achieved by spectrophotometer and Liquid Chromatography. Tannins and anthocyanins are frequently used as wine quality assessment since they contribute to color stability and astringent potential in wine. BC



winemakers will benefit from this project through identifying distinctive features of their wine for better competitive factors in the globalized market. For research purposes, this is a first step to identify native and regional wine yeast strains with the intention to create special inoculates in the future that guarantee predictable yet regional-specific wine fermentation.

Summary of what you would like to do with your mentees (400 words max):

Human norovirus is responsible for around 300-400 reported foodborne outbreaks in Canada every year and it is the major cause of acute gastroenteritis worldwide. People who are infected with norovirus would suffer from nausea, diarrhea, and etc. In addition, children, elderly and hospitalized patients with compromised immune systems can develop more serious condition. To date, there is no vaccine available in preventing norovirus infection. Norovirus can be spread by consumption of contaminated food, contacts of infected patients or contacts of contaminated surfaces with norovirus. Therefore, decontaminating food produces and surfaces with norovirus is a major approach to prevent norovirus infection.

As plants are abundant natural resources, plant extracts with antimicrobial materials can be produced at a low cost with a high consumer acceptance. In recent years, multiple studies have been conducted on norovirus surrogates to investigate the antiviral potential of natural extracts and its major constituents towards human norovirus. The results show that plant extracts, including clove, ginger and black raspberry



seeds, have potential to prevent norovirus transmission. These plant extracts can alter the morphology of virus capsids which influence the virus attachment to the host cell upon infection.

Thus, in this research project, I would like to work with a group of student to discover new plant materials that have potential in preventing norovirus transmission. We will develop methods to examine interactions of plant extracts with norovirus surrogates in order to understand the inhibitory mechanism of the antimicrobial materials. Also, we will discuss about different norovirus surrogates and select the most suitable one for this research. This research is important in protecting public health and food safety since the results can be used to develop new non-thermal strategies for inactivation of viral transmission during food processing.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/26143492>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/26983677>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/27296605>

Keyword #1:

Microbiology

Keyword #2:

Virus



Name:

James Jabalee

Degree or Position:

Ph.D.

Institution:

BC Cancer Research Center

Department:

Integrative Oncology

Field of Research:

Head and neck cancer, lung cancer, extracellular vesicles

Quick summary of your research (200 words max):

Extracellular vesicles (EVs) play a central role in communication among cancer cells and cells of the tumor microenvironment. EVs are like packages, delivering molecular cargo from one cell to another. Each EV is loaded with a specific molecular cargo, including DNA, RNA, and protein, which regulates gene expression in recipient cells. EVs produced by cancer cells often promote tumor growth by telling blood vessels to proliferate, immune cells to shut down, and fibroblasts to secrete tumor-supportive chemicals. The mechanisms by which EVs are generated and packaged - and how these mechanisms are altered in cancer cells - is an area of great interest to our lab.

Summary of what you would like to do with your mentees (400 words max):

The Garnis lab located at the BC Cancer Research Center is particularly interested in cancers of the head and neck and the lung. As a 4th year PhD student, I study the molecular machinery underlying EV biogenesis and how



it changes during progression of these cancers. To achieve this, our lab draws on various sources of data including gene expression and DNA methylation data from cell lines, patient-derived samples, and publicly available resources such as The Cancer Genome Atlas. This project will involve the identification of EV-related genes deregulated in cancer using large data sets and formation of new hypotheses regarding these genes to guide future laboratory work. Individuals with original ideas regarding EV biology in cancer are encouraged to pursue this work under guidance of our laboratory. By identifying EV-related genes that are deregulated in cancer, we can improve our understanding of tumorigenesis and potentially identify new biomarkers and drug targets to improve patient care.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/24035722>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/30071693>

Citation #3:

nan

Keyword #1:

Cancer biology

Keyword #2:

Extracellular vesicles



Name:

Jorge Lozano

Degree or Position:

Master's

Institution:

UBC

Department:

Electrical and computer engineering

Field of Research:

Biomedical, microdevices

Quick summary of your research (200 words max):

As a biomedical engineer I am interested in the application of engineering in the medical field.

The objective of my research is to overcome the challenges of wet electrodes. Wet electrodes are the conventional metal plates that are placed over different parts of the body to record bio-signals like brainwaves or electrocardiogram. The problem with this wet electrode technology is that it needs a conductive gel to work. This gel limits the performance of the electrode because, as you can imagine, it is not very comfortable to have 10 or 128 electrodes with gel over your body for more than one hour or while you sleep. Furthermore, during long time measurements conductive gel dries and the quality of the recorded signal decreases.

So, I am focusing my research in the design of a dry electrode for sleep disorders monitoring using an array of microneedles (needles smaller than 0.5 millimeters!). These microneedles are long enough to pass the most superficial layer of the skin but at the same time they are smaller enough, so they will not reach pain nerves or blood vessels, so they don't hurt. By reaching moist cells in the skin this electrode can record signals from the body without the use of gel.

Summary of what you would like to do with your mentees (400 words max):

I am open to work on any project that involve the design of devices to improve healthcare, from wearable technology to smart implantable devices. I would like to work with people interested in the design of Medical devices and open to learn from multiple domains (anatomy, electronics, materials) as the biomedical field normally requires interdisciplinary knowledge. This type of research is commonly very hands on, but I imagine that this project could easily start by getting a good understanding of the problem that we want to tackle, understand the previous work and their challenges, get the engineering foundations to solve them, and propose a solution that maybe we could support with simulation tools.

Citation #1:

<http://www.mdpi.com/1424-8220/14/7/12847/htm>

Citation #2:

<https://www.sciencedirect.com/science/article/pii/S092540051730059X>

Citation #3:

<https://www.sciencedirect.com/science/article/pii/S0924424712002440>

Keyword #1:

Graduate and Postdoctoral Studies

Biomedical engineering

Keyword #2:

Microdevices



Name:

Grant Sawatzky

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Music Theory

Field of Research:

Music Analysis; Phrase Rhythm; Transcription

Quick summary of your research (200 words max):

My research investigates phrase rhythmic structure in music that is often characterized as being rhythmically "irregular" (e.g. early 20th-century "classical" music like Bartók & Stravinsky; folk traditions from central and eastern Europe; or early American blues music). My dissertation work offers a critique of some prevailing theories of musical meter as relates to phrase structure and harmonic rhythm; and proposes a way to describe the varieties of phrase-rhythmic structure a piece of music creates, rather than emphasizing the ways in which phrase rhythm "departs from" a preconceived regular structure or model (like the "regularity" of rhythmic structure conveyed by a time-signature in notated music, for example).

Wider applications of my research exploring intersections between music theoretical topics—especially those that emphasize "idiosyncrasy"



and “difference” and related topics and concerns in Ethnomusicology, Cultural Anthropology, or Aesthetics.

Summary of what you would like to do with your mentees (400 words max):

I am open to supervising any music-related topic, which could include music history topics, music theory & analysis, ethnomusicology, or popular cultural criticism. Mentees are encouraged to bring ideas from philosophy, anthropology, linguistics, psychology, mathematics, or data science into the development of their research question and project” and I am happy to be your guide as together we explore ways in which methods from those disciplines intersect with current, and past music research.

I would like to especially encourage student projects that deal with representing aspects musical structure: this could mean dealing with ways of representing and summarizing musical data of various kinds; or could have to do with producing, and/or critically evaluating “transcriptions” of musical performances from any musical tradition (rap, EDM, classical, funk, traditional/world music, free jazz, vaporwave”surprise me!) The transcriptions could be in “traditional” Western notation, or in some other mode of representation”the chosen mode of representation would itself become part of the research topic. Musical training is an asset for this particular kind of project, but potential mentees do not necessarily need to be familiar with Western music notation.

Citation #1:

<https://www-cambridge-org.ezproxy.library.ubc.ca/core/journals/twentieth-century-music/article/forum-on-transcription/1EA37E8D49A0D163DF78719C96CC810A>

Citation #2:

<https://www-jstor-org.ezproxy.library.ubc.ca/stable/10.5406/ethnomusicology.56.3.0530?Search=yes&resultItemClick=true&searchText=Gabriel&searchText=Solis&searchUri=%2Faction%2FdoAdvancedSearch%3Fc4%3DAND%26amp%3Bq4%3D%26amp%3Bisbn%3D%26amp%3Bed%3D%26amp%3Bacc%3Don%26amp%3Bq5%3D%26amp%3Bf3%3Dall%26amp%3Bla%3D%26amp%3Bc5%3DAND%26amp%3Bf6%3Dall%26amp%3Bc2%3DAND%26amp%3Bf2%3Dall%26amp%3Bf1%3Dall%26amp%3Bq0%3DGabriel%2BSolis%26amp%3Bq1%3D%26amp%3Bc3%3DAND%26amp%3Bc1%3DAND%26amp%3Bq6%3D%26amp%3Bc6%3DAND%26amp%3Bq2%3D%26amp%3Bgroup%3Dnone%26amp%3Bf5%3Dall%26amp%3Bq3%3D%26amp%3Bf4%3Dall%26amp%3Bpt%3D%26amp%3Bsd%3D%26amp%3Bf0%3Dau&refreqid=search%3A140caf2a71b1acd5a52bbaf198327b1a>

Citation #3:

<http://www.mtosmt.org/issues/mto.09.15.5/mto.09.15.5.adams.html>

Keyword #1:

music

Keyword #2:

interdisciplinary



Name:

Dylan S Stephanian

Degree or Position:

Master's

Institution:

UBC

Department:

Experimental Medicine

Field of Research:

Prehospital trauma care and resuscitation

Quick summary of your research (200 words max):

My research is for the Canadian Coast Guard, with help from the B.C. Ambulance service. The focus is on the treatment and resuscitation of patients with blunt traumatic injuries. The project I am currently working on is interested in what happens to people who attempt suicide by jumping from bridges. The project has three primary objectives. First to describe the patient population, their injuries and their outcomes. Secondly to determine which factors have the most significant effect on patients' outcomes following a jump and what can be done about them. Finally I am interested in how effectively information is communicated between the various organisations that assist a person who has jumped from a bridge. My belief is that a limited number of factors make a significant difference in trauma patient outcomes. If we can identify and focus on these factors, we can improve outcomes for these patients.

Summary of what you would like to do with your mentees (400 words max):



A topic that is currently of interest to me is prehospital to hospital handovers in trauma. When paramedics deliver a patient to the emergency room, they have to quickly convey a lot of complex information in a chaotic environment. Unfortunately, this often ends with information being missed or misunderstood by emergency physicians. Hoping to address this problem, a number of standardised protocols have been implemented and tested around the world. The benefits of each of these systems is not clear; while we know that these protocols improve the accuracy of information transfer, we don't actually know if they improve patient outcomes. I propose that students research the proposed new protocols for paramedic handovers and choose the two or three they think are best. Then, design a research project to compare these two or three promising handover protocols. This study should try to determine if any of these protocols help to make patients better, worse, or just the same as before. Designing this study will give you an opportunity to learn how to refine a complex problem into a simple, testable research question.

In practice, a study like this would likely take two to five years to arrange and complete, and another year or so to analyse and publish your findings. However, since you won't have to train any paramedics or physicians, or get permission from anyone, it should fit quite nicely into the REX timeline.

Citation #1:

<https://emj.bmj.com/content/early/2014/09/01/emersed-2013-203165>



Citation #2:

<https://www.tandfonline.com/doi/abs/10.1080/10903127.2016.1194930?journalCode=ipec20>

Citation #3:

<https://www.sciencedirect.com/science/article/pii/S1755599X10000868>

Keyword #1:

Prehospital Care

Keyword #2:

Clinical Research



Name:

Roula Farag

Degree or Position:

Master's

Institution:

UBC

Department:

Medical Genetics

Field of Research:

Developmental genetics of uveal melanoma

Quick summary of your research (200 words max):

Cancer is a highly heterogeneous disease that is caused by uncontrolled cellular proliferation. I am interested in the study of the complex signalling pathways involved in cancer initiation and progression. My goal is to apply this knowledge in translational research to discover potential targets for treatment.

As a Medical Genetics Master's student, my research will focus on the developmental genetics of uveal melanoma. Uveal melanoma is a type of cancer that arises in the eye. I plan to study the role of G proteins and Endothelin receptors in the signalling pathways involved in uveal melanomagenesis. The long-term goal of this type of research is to potentially synthesize small molecule inhibitors that can be used as a therapeutic treatment for patients with uveal melanoma.

Summary of what you would like to do with your mentees (400 words max):



There are endless avenues for cancer research projects and I am willing to help with any type of cancer-related research you're interested in. This is a great opportunity for you to understand the process of producing your own research and it's an opportunity for me to learn more about this field and share new ideas!

Initially we will focus on gaining more knowledge on the topic of interest by reading the latest literature reviews and research papers. After that, hopefully you will get a better idea of the hypothesis or research questions you want to ask. Once we have narrowed down a research question we can begin drafting the experimental design, data results and conclusions.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/27148356>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/26113083>

Citation #3:

nan

Keyword #1:

Cancer, Uveal melanoma

Keyword #2:

Developmental genetics, signalling pathways



Name:

Valentin Prevost

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

UBC MRI research center

Field of Research:

MRI research

Quick summary of your research (200 words max):

My work concerns the research of new biomarkers in the brain, observable with Magnetic Resonance Imaging (MRI). MRI is nowadays an indispensable tool for obtaining images of the inside of the body, without being invasive. As a neuroscience PhD, I chose to focus my studies on neurons, which is especially challenging considering their very small size. Neurons are essential for the communication between the brain and the body, and their study is fascinating! The conduction of the information along the axons is extremely fast and requires a complex system to be optimal. One key component is the presence of a protective sheath around the axon named "myelin". Its integrity is crucial and its destruction could lead to severe troubles as is the case in multiple sclerosis (MS) in the form of lesions. Being able to have myelin quantitative imaging would be particularly relevant in order to characterize these lesions and to evaluate the efficiency of treatments which try to stimulate the growth of



new myelin in these areas. This work needs a transversal approach and that is why I work on brain samples first, on mice, healthy humans and then directly on MS patients.

Summary of what you would like to do with your mentees (400 words max):

Different approaches are developed today to image the myelin in the brain and the spinal cord but each of them have their own advantages and constraints. Nevertheless, two modalities seem to be distinguished by their quantitative properties and their high specificity to myelin. The myelin water fraction (MWF) imaging is one of the most advanced methods with a signal sensitive to the protons of water trapped between myelin bilayers (ref 1). This technique has been historically introduced in UBC and it's still constantly improved thanks to important efforts of the scientific community and supports of the MS society. Another technique that shows a high sensitivity to myelin is the very recently presented inhomogeneous magnetization transfer (ihMT). This approach is derived from the conventional magnetization transfer method, but uses a different saturation scheme allowing to isolate the tissue component with a high dipolar order (ref 2). Because of its multilamellar organization and strong lipid concentration with highly anisotropic motion, myelin is one of the only in vivo structures to have a dipolar order with a sufficiently long life-time to be detected by ihMT. These two methods are based on different physical mechanisms and their comparison provides precious information concerning the myelin state.



This study is considered today as a “hot topic” and is sufficiently wild to interest scientists with a physics, medicine or biology background. I propose to supervise a group of students motivated by the problem and by the research area. An important bibliographic work will be mandatory to understand the MRI basic knowledge and the biology of the central nervous system. Scientific paper presentations by mentees will be organized in October and November. Group discussions will allow to clear a problematic (November) and an appropriated method (December) in order to submit a scientific abstract. Highly motivated students will even have the chance to assist with MRI acquisitions on human brain samples at the UBC MRI research center, and to be part of the data processing, its interpretation and its discussion. Students will be sensitive as far as possible to the scientific approach and to the critical mind. Global questions concerning the research area will be also broached in order to potentially help them in their orientation choice.

Citation #1:

MacKay A, Whittall K, Adler J, Li D, Paty D, Graeb D. In vivo visualization of myelin water in brain by magnetic resonance. *Magn. Reson. Med.* 1994;31:673-677.

Citation #2:

Girard OM, Prevost VH, Varma G, Cozzone PJ, Alsop DC, Duhamel G. Magnetization transfer from inhomogeneously broadened lines (ihMT): Experimental optimization of saturation parameters for human brain imaging at 1.5 Tesla: Optimizing Saturation Parameters for ihMT Brain Imaging at 1.5T. *Magn. Reson. Med.* 2015;73:2111-2121. doi: 10.1002/mrm.25330.

Citation #3:

Prevost VH, Girard OM, Mchinda S, Varma G, Alsop DC, Duhamel G.



Optimization of inhomogeneous magnetization transfer (ihMT) MRI contrast for preclinical studies using dipolar relaxation time (T_{1D}) filtering. NMR Biomed. 2017:e3706. doi: 10.1002/nbm.3706.

Keyword #1:

MRI

Keyword #2:

Myelin



Name:

Oscar Urtatiz

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Medical Genetics

Field of Research:

Cancer cell biology

Quick summary of your research (200 words max):

Hello! Iâ€™m a PhD candidate in the department of Medical Genetics with an interest in cell/developmental biology and cancer.

I study the biology of melanocytes, the cells that pigment the skin, eyes and hair, to understand both their normal development and the process by which they are transformed into cancer cells (melanoma).

Summary of what you would like to do with your mentees (400 words max):

One major emphasis of my project is to study the effects of a particular oncogene that drives uveal melanoma and non-epidermal melanoma in people: GNAQ.

Our lab engineered the first GNAQ knock-in mouse model, which expresses the oncogenic version of GNAQ in a melanocyte-specific manner. Therefore I have been able to obtain interesting results from these GNAQ-melanocytes using in-vitro (cell culture) and in-vivo experimental approaches (RNA sequencing of melanocytes isolated directly from skin). Based on an



initial lit review, we will draft some initial research questions, and then return to the literature to refine one or two research questions that we might want to pursue.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4837292/>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/29570931>

Citation #3:

nan

Keyword #1:

Melanocyte

Keyword #2:

Cancer biology



Name:

Ivan Klyuzhin

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Medicine

Field of Research:

medical image analysis

Quick summary of your research (200 words max):

I develop image analysis and machine learning techniques for positron emission tomography (PET) imaging. PET is a medical imaging modality that uses radiotracers to quantitatively assess the physiological function of tissues in-vivo. This enables the use of PET for a variety of medical applications; for example, clinical cancer screening and staging, and research of neurological disorders.

My work focuses on the development of algorithms that can measure disease-related image properties, such as tumor shape, texture, and size, or the distribution of receptors in the brain. Texture and shape features extracted from medical images are used in conjunction with machine learning to track and predict progression of neurological diseases, such as Parkinson's disease. Some of the methods that I develop are based on artificial neural networks and deep learning (including convolutional



neural networks and autoencoders). My most recent research is on the application of convolutional neural networks to nuclear emission images for prediction of Parkinson's disease progression. I perform testing and evaluation of different neural network architectures as well as explore different ways to use them.

Summary of what you would like to do with your mentees (400 words max):

I will work with the mentees to validate new, advanced image analysis methods for use in PET imaging of cancer and/or neurological disorders. Our work may contribute to more accurate automatic disease detection, staging, and development of personalized treatment plans.

In the medical imaging community, there is indeed a growing interest in applying advanced image analysis methods to PET images. For example, it has been shown that texture and shape features, combined with machine learning methods, can improve the accuracy of automatic tumor detection. Deep learning methods are being used more extensively for tumor image analysis, or image enhancement. Unfortunately, such novel image analysis methods are yet poorly understood and characterized when applied to PET; for example, it is not clear how to identify the best image features (out of possible hundreds) for automated image classification; how to construct features that are robust to noise; or, how to choose the best neural network architecture for a particular image-based classification task.

We will work on projects that will tackle these issues. Any previous



experience with scripting languages, such as Matlab or Python, would be a big plus. We will construct and use simple computational disease models to characterize and validate new image analysis methods and algorithms. We will generate synthetic PET images with realistic noise, which will be used to objectively compare different analysis methods. The data for this research will be mostly simulated. However, we can also use publicly available PET image datasets. Depending on the progress, we will make our results and data publicly available.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5299095/>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/28595812>

Citation #3:

<https://ieeexplore.ieee.org/abstract/document/8372961/>

Keyword #1:

medical image analysis

Keyword #2:

machine learning



Name:

Michael Kinach

Degree or Position:

Master's

Institution:

UBC

Department:

Physics and Astronomy

Field of Research:

Theoretical Physics

Quick summary of your research (200 words max):

What happens when black holes collide? How can space and time be curved? Why do some stars collapse into black holes? These are fundamental questions that are very difficult to answer. Luckily, the rapid development of computing in the last few decades has thrown open the door to these problems. Using advanced algorithms and high-powered supercomputers, physicists are now able to answer these questions using computer simulations.

In my research, I help to create some of these computer simulations. I am currently studying high-energy collisions of cosmological objects called Q-Balls. Q-balls are thought to play a role in the formation of the early universe and may explain the existence of dark matter. I am also interested in the Alcubierre spacetime, a hypothetical 'warp drive' that exists in Einstein's theory of general relativity.

Summary of what you would like to do with your mentees (400 words max):

Your research project would be in the area of computational physics. You would have some freedom to choose a specific research topic depending on your knowledge & interests. A more advanced student could pick a topic in my area of expertise (general relativity) while a less experienced student might choose from another field such as quantum mechanics, electromagnetism or classical mechanics. In either case a strong emphasis will be placed on programming. Knowledge of partial differential equations would also be an asset. However, the choice of topic will be tailored to the skill level of the student.

The first phase of the project is to perform a literature review and formulate a suitable research question. The second phase is to learn the basic skills of computational physics and apply it to a simplified version of the research problem. The third phase is to attempt to solve the full research problem (if time permits).

The citation links show some examples of research topics at different skill levels.

Citation #1:

<https://web.math.pmf.unizg.hr/nastava/nmf/Lopta.pdf>

Citation #2:

http://www.bcmath.org/projects/NUMERIWAVES/Burgers_Equation_M_Landajuela.pdf

Citation #3:

<https://arxiv.org/pdf/1507.04428.pdf>

Science



Keyword #1:

Physics

Keyword #2:

Mathematics

Name:

Yinlue Wang

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Geography

Field of Research:

Geomorphology, Sediment transport, Rivers

Quick summary of your research (200 words max):

Hello! I am a PhD candidate with interest in geomorphology. Geomorphology is a discipline that deciphers the change of landscape, a poem of earth written in ostensibly familiar yet mysterious ways such as tectonic movement, fluvial processes and bioturbation. My research mainly focuses on the bed structures in gravel-bed rivers.

Gravel-bed rivers are common in montane and upland areas (e.g., British Columbia) and they are critical in hazard management, irrigation and river ecology. However, gravel-bed rivers are poorly understood. One main reason is that gravel-bed rivers contain a kaleidoscope of bed structures. These bed structures significantly influence sediment transport, enhance the stability of bed surface and make flow-based sediment transport estimation subject to errors larger than one order of magnitude.

Graduate and Postdoctoral Studies

I approach my research question in three ways: fieldwork, laboratory experiments and numerical modelling. I survey bed structures in my research sites and analyze previous field data; I conduct experiments to simulate river processes in the Mountain Channel Hydraulic Experimental Laboratory at UBC, And I will build a numerical model inspired by other disciplines such as granular physics. My research is both classic and cutting-edge, and will have scientific merit and benefit our society.

Summary of what you would like to do with your mentees (400 words max):

I will do my best to support my mentees. After the REX program, I hope my mentees will have a taste of scientific research, be able to independently conduct small projects and know how to become a fully-fledged earth scientist.

Fluvial geomorphology encompasses a wide range of research methods and subjects, and I will tailor the REX projects for my mentees' individual interests: If my mentees want to analyze first-hand data, I can bring them to our research sites; If conducting experiments with controlled conditions and detail measurement suits my mentees' interest, they are welcome to use the Mountain Channel Hydraulic Experimental Laboratory at UBC, a world-class laboratory with supportive lab technicians; If my mentee is curious about numerical modelling, I will help him or her build a model written in MATLAB or Python. Want to jump into analyses directly? My mentee can also start with current datasets. As long as my mentees are passionate about understanding rivers, I can find resources and discuss

potential projects, either science-oriented or industry-related, with my mentees.

Once my research group is established, I will talk to my mentees about their expectations, invite them to my lab meetings and related seminars, give them a brief tour of my laboratory and guide my mentees through literature reviews, which will help them specialize in their interests. Once my mentees decide their research goals, we will talk about research hypotheses, data collection and preliminary analyses. Then, my mentees can work on their own projects before their presentations during MURC.

I hope the mission of REX is not only met, but exceeded. The presentations at MURC can be a good start, and I will help my mentees after this program if they wish. If my mentees want to collect more data, they are welcome to apply for research assistants in UBC Geography. I will also help them publish their findings in scientific journals, and my ultimate wish is that my mentees can continue and enjoy their scientific journeys. My mentees' success is my success!

Citation #1:

http://science.sciencemag.org/content/325/5947/1509?casa_token=8BvByAhHRKwAAAAA:zRNJJzDO-mZclZzeejNs398gwrKMc-0tsYMEIdnOoGGEa4G1mRkaBWC496w5sTqtqkc1zyboylGbVno

Citation #2:

<https://onlinelibrary.wiley.com/doi/abs/10.1002/9781118971437.ch16>



Citation #3:

nan

Keyword #1:

Fluvial geomorphology

Keyword #2:

River bed structures



Name:

Mohammad Karamouzian

Degree or Position:

Ph.D.

Institution:

UBC

Department:

SPPH

Field of Research:

Substance use harm reduction

Quick summary of your research (200 words max):

Injection drug use among youth is a significant public health concern that is associated with severe harms among youth including, alarming rates of fatal overdose, as well as HIV and Hepatitis C (HCV) incidence. While there is growing recognition that contextual factors play a central role in determining youth's high-risk drug using behaviours, little is known about their initiation into injecting, injection cessation, and sustained injection. Moreover, our understanding of the characteristics of early injecting careers and potential points for intervention are limited. Therefore, Mohammad's research proposes to employ longitudinal data analyses to characterize early injecting careers, with a focus on the individual (e.g., childhood trauma) and social-structural (e.g., homelessness) factors that shape initiation, early cessation and sustained injecting. Findings of this research are essential to developing meaningful and effective policy and program interventions that seek to



prevent early injecting careers from progressing to sustained injection practices.

Summary of what you would like to do with your mentees (400 words max):

I am happy to share ideas about and oversee a wide range of topics in harm reduction research (e.g., substance use prevention and treatment) and improving the health of marginalized populations (e.g., people who inject drugs, femalesex workers)

Citation #1:

<https://www.ncbi.nlm.nih.gov/m/pubmed/29091340>

Citation #2:

<https://www.ncbi.nlm.nih.gov/m/pubmed/28859728>

Citation #3:

<https://www.ncbi.nlm.nih.gov/m/pubmed/28643100>

Keyword #1:

systematic reviews

Keyword #2:

HIV, injection drug use



Name:

Nirma Khatri Vadlamudi

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Collaboration for Outcomes Research and Evaluation (CORE)

Field of Research:

Health Economics and Outcomes Research

Quick summary of your research (200 words max):

I am a PhD Student in Faculty of Pharmaceutical Sciences, University of British Columbia studying health and economic outcomes research under the supervision of Dr. Fawziah Lalji . My focus is evaluating the health and economic impact of 13-valent pneumococcal conjugate vaccine use in British Columbia.

Summary of what you would like to do with your mentees (400 words max):

In the last year, I collaborated with 3 undergraduate students from REX program to conduct systematic review and meta-analysis of comparing immunogenicity and safety of 13-valent pneumococcal conjugate vaccine (PCV13) to 23-valent pneumococcal polysaccharide vaccines in adults. Currently, I am working with administrative health databases for my research. This year, I am looking forward to work with students who are interested in exploring pneumococcal disease related hospitalization in British Columbia and cost-effectiveness of PCV13 vaccine use in adults.

Pharmaceutical Sciences



This research project is multidisciplinary encompassing different areas: microbiology, immunology, public health, public policy, epidemiology, economics, statistics and computer science. I am happy to explore any of the topics with students.

Citation #1:

<http://www.aginganddisease.org/EN/10.14336/AD.2018.0512>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/30188808>

Citation #3:

nan

Keyword #1:

Health Outcomes

Keyword #2:

Pneumonia

Education



Name:

Nana Wu

Degree or Position:

Ph.D.

Institution:

UBC

Department:

School of Kinesiology

Field of Research:

exercise, chronic disease, obesity, diabetes

Quick summary of your research (200 words max):

Type 1 diabetes increases the risk of cardiovascular disease related mortality, independently of traditional cardiovascular risk factors. Exercise can decrease risk factors of cardiovascular disease by improving cardiovascular fitness, endothelial function, and vascular health. However, many individuals with type 1 diabetes struggle with lack of appropriate exercise prescription required for improving glycemic control. This also coupled with the fear of hypoglycemia both during exercise and subsequently overnight. We hope to develop exercise cardiovascular health promotion interventions appropriate to the fitness level of patients living with type 1 diabetes and improve their quality of life.

Summary of what you would like to do with your mentees (400 words max):

The students will have the opportunity to learn and participate in systematic reviews and the prevention of cardiovascular disease in children living with type 1 diabetes program. We will supervise the

Education



high-intensity interval exercise intervention of children living type 1 diabetes and do the pre and post assessment of health-related physical and exercise medicine settings in the program.

Citation #1:

<https://link.springer.com/article/10.2165/00007256-200737110-00002>

Citation #2:

<http://journals.sagepub.com/doi/abs/10.1097/01.hjr.0000131677.96762.0c>

Citation #3:

<https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1463-1326.2012.01564.x>

Keyword #1:

exercise

Keyword #2:

chronic disease



Name:

Oladele Atoyebi

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Rehabilitation Sciences

Field of Research:

Technology in Aging (Gerontechnology)

Quick summary of your research (200 words max):

At the GF Strong Rehabilitation Research Lab, our research team is engaging family caregivers across Canada to identify their needs and the most preferred technology to address them. We also aim to design a prototype of the technology that caregivers desire to have. Information on the progress we have made in our research has been presented at scientific conferences and will be published in a peer-reviewed journal soon.

Who are family caregivers? Family caregivers are those who provide unpaid care to a family member or friend with a long-term health condition or problems related to aging.

Why focus on family caregivers? I am interested in the wellbeing of family caregivers because they have a high risk of stress as a result of juggling the duties of caregiving with other personal responsibilities. Despite the challenges of caregiving, caregivers tend to struggle in silence and are often neglected by the care system built for the care recipient. However,



research has shown that technology can be used to assist caregivers as they perform their duties. The appropriate assistive technology would really help reduce caregiver burden.

Summary of what you would like to do with your mentees (400 words max):

I am a PhD student in Rehabilitation Sciences with a background in public health and gerontology. My research focuses on a user-centred approach to identify and design novel technology for family caregivers of older adults with neurocognitive disorders.

You are welcome to come and explore the concept of user - centred design and the way we apply it to developing novel technology for caregivers. I am also open to projects that are related to the health of older adults and those who care for them. One direction I might be interested in going with this is exploring the ethics of video surveillance in dementia care. We can review literature on the opinions of caregivers or care recipients on the use of cameras and sensors to monitor their safety. This can be done over a period of six months depending on the schedule of all parties involved.

Alternatively, we can take a look at existing literature on the use of marijuana by seniors across the world. We can look at the pattern of use and any documented effects of hemp on the health of older adults in a scoping review. This review can also be completed in six months, all things being equal. I will actively support my mentees to write and submit our findings for publication in a peer-reviewed journal.

I am flexible and willing to accommodate research interests that may not



be too related to what I currently do as long as I have a reasonable level of knowledge of the area of research chosen.

Citation #1:

<https://www.tandfonline.com/doi/full/10.1080/17483107.2017.1353652>

Citation #2:

<https://link.springer.com/article/10.1007/s12126-014-9204-0>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/27177609>

Keyword #1:

Technology in Aging

Keyword #2:

Family caregiver



Name:

Maen Obeidat

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Respiratory Medicine

Field of Research:

Genetics, genomics, bioinformatics

Quick summary of your research (200 words max):

My research is focused on studying genetics, gene and protein expression and their integration to better understand the biology of common lung disease called chronic obstructive pulmonary disease (COPD). We aim to translate big data into biologically and clinically actionable information that includes the identification of novel drug targets and/or biomarkers.

Summary of what you would like to do with your mentees (400 words max):

The students can work on any of many ongoing projects related to genetic association studies, gene and protein expression analyses and the integration of disease genetics with the genetics of gene and protein expression (integrative genomics). There is also possibility for bioinformatics analyses related to findings from these studies that involves deep investigations of the biology of candidate genes and proteins. During their time in the group, the students will be introduced to contemporary concepts in the biology of common airway diseases,



genetics, integrative genomics, bioinformatics, and statistical and computer analyses.

Citation #1:

<https://www.nature.com/articles/s41598-018-30313-z>

Citation #2:

<http://erj.ersjournals.com/content/50/5/1700657>

Citation #3:

[https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(17\)30387-9/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(17)30387-9/fulltext)

Keyword #1:

genetics

Keyword #2:

bioinformatics

Name:

Farhad Rahimi

Degree or Position:

Master's

Institution:

UBC

Department:

Materials Engineering

Field of Research:

Metal forming, mechanical properties of materials, additive manufacturing, residual stress, metal forming simulation, plastic deformation

Quick summary of your research (200 words max):

Additive manufacturing, also known as 3D printing or rapid prototyping, is a way of producing ceramic, polymeric and metallic components with complex geometry. In the past decades, researchers tried to study the feasibility of manufacturing parts through these methods with the goal of near net-shape parts and/or high quality surface to omit the necessity of extra post processing operations such as machining. Nowadays, many researchers around the world are focusing on improving the quality and dimensional stability of the additively manufactured parts by adjusting processing parameters with the goal of industrialization.

However, like any other manufacturing processes, several defects are observed, including porosity, internal cracks, residual stresses, keyholes, element evaporation and etc.

My main work focuses on evaluation and calculation of residual stresses,



the very nature of it, in these parts. I will use electron beam melting technique to print these parts. There are several techniques to calculate residual stresses as a post processing operation which provides you with some idea over the parameters needed to be modified accordingly to print a stress-free parts and keep dimensional accuracy.

Summary of what you would like to do with your mentees (400 words max):

I have a background in Materials Engineering with research experiences in Metal forming operations and manufacturing including sheet severe plastic deformation, sheet metal forming, bulk-forming and forging. Worked on various research/industry based project involving FEM modeling, designing proper processing map and improving mechanical properties, specifically for Aluminum alloys, 2XXX, 6XXX and 7XXX.

Also worked on Bulk Metallic Glasses (BMGs) to investigate plastic deformation behavior using STZ modeling.

Currently, Working on Electron Beam Additive Manufacturing with a research focus on measurements and predictions of residual stresses in Ti-alloys.

Research interests are:

â€¢ Hot deformation and Plasticity

â€¢ Sheet and bulk forming

â€¢ crystal plasticity

â€¢ Mechanical properties

â€¢ Additive manufacturing

â€¢ Residual stress measurements

In terms of project for undergrad students, there are several fields which I am very interested as I mentioned above. I can come to an agreement with the students over the project or topic that they are interested most. Probably starts with the fundamentals and work the way up.

Citation #1:

<https://www.sciencedirect.com/science/article/pii/S092150931401524X>,

<https://www.sciencedirect.com/science/article/pii/S0264127515003573>,

Citation #2:

<https://www.sciencedirect.com/science/article/pii/S2214785317322721>,

Citation #3:

<https://www.sciencedirect.com/science/article/pii/S0079642517301172>

Keyword #1:

additive manufacturing, residual stresses

Keyword #2:

mechanical properties, metal forming



Name:

Eom, Tae Yeon

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Asian Studies

Field of Research:

East Asian History

Quick summary of your research (200 words max):

I am a PhD student in Asian Studies and an Academic Graduate Assistant in the Asian Library. My PhD dissertation will discuss how diplomatic practices of exchanging human and non-human actors started to be patterned and standardized from the late nineteenth century, especially in East Asia. My journal articles cover a wide range of topics in various fields such as international photojournalism, modern Chinese history, political history of Korea, and diplomatic architecture and space in Japan. My research adopts a contextual approach to the study of comparative East Asian history and socio-politics in a global and intercultural context.

Summary of what you would like to do with your mentees (400 words max):

I would like to help my mentees to:

- Conduct literature searches on topics of interest
- Expand their knowledge in reference and research skills, instructional skills, collection development activities, and all other aspects of the



position, to increase competence at work and in their own fields of study.

- Contribute to reporting their findings in papers and presentations

I can provide my mentees with:

- Regular meetings for setting learning objectives, reviewing progress, and fostering reflection
- On-going communications for support, and a natural environment for mentorship and support
- On-going debriefing to enhance deep learning and designated time for reflection
- Continuous positive feedback and transparent, open communication

I expect my mentees to:

- Ask questions and raise issues that they wish to discuss throughout the year.
- Enhance their classroom learning by learning to use library resources and tools effectively.
- (for students with multilingual backgrounds) Use their language skills in their research environment while dealing with research materials in different Asian languages.

Citation #1:

https://issuu.com/outsideinjournal/docs/outside-in_-_int

Citation #2:

<https://issuu.com/pjeas>

Arts



Citation #3:

nan

Keyword #1:

East Asian History

Keyword #2:

Diplomacy & International Relations



Name:

Benson Chang

Degree or Position:

Master's

Institution:

UBC

Department:

Chemical & Biological Engineering

Field of Research:

Cannabinoid biosynthesis in metabolically engineered bacteria

Quick summary of your research (200 words max):

Microbes are some of the most versatile and efficient biological machines in nature. They have evolved to be able to thrive in virtually any hostile environment, and can evolve to be able to consume and produce a variety of chemical products, leading microbes to be one of nature's most powerful biological factories.

In fact, today many compounds are actually biosynthesized commercially by microbes as metabolites. Microbes are used to produce therapeutic drugs in the pharmaceutical industry, and can even be used to produce essential oils in the cosmetics industry.

My research focus is on engineering bacteria to produce cannabinoids, the chemical compounds produced from Cannabis sativa, more commonly known as marijuana. The marijuana plant produces >113 known cannabinoids, the most



abundant being THC and CBD, all with unexplored therapeutic properties, but the plant produces the other hundred cannabinoids in such miniscule amounts that producing them via plant extracts would not be commercially feasible. Therefore, our lab group collaborates with a local company to engineer a bacterial strain to potentially mass produce the less common cannabinoids at commercial scale.

Summary of what you would like to do with your mentees (400 words max):

I am looking for mentees that have an interest in research in biotechnology, genetic engineering, bioprocess engineering, and/or microbiology. Mentees should enjoy working together in a team to tackle challenging research problems and will have a glimpse into what industry R&D is like. I do not require you to have prior research experience, but If my specific research focus interests you, you can even participate in the hands-on lab experience that is essential to gain in this field of work.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5812543/>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/30053500>

Citation #3:

nan

Keyword #1:

Biological engineering

Keyword #2:

Biotechnology



Name:

Delaram Behnami

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Electrical and Computer Engineering

Field of Research:

Biomedical engineering, machine learning, image analysis

Quick summary of your research (200 words max):

My research involves applying biomedical technologies for improving clinical workflow using artificial intelligence, specifically, deep learning. I've worked on a variety of medical imaging modalities (ultrasound, CT, MR). I have experience in registration, segmentation, and pathology detection from these images for anatomies such as the spine and the heart.

Summary of what you would like to do with your mentees (400 words max):

Refer to them to material I used and found helpful in my field (papers, tutorials, youtube videos, discussion forums, etc.), discuss existing literature in the field, providing feedback to the mentees, giving time and project management tips, etc.

Citation #1:

<http://gw2jh3xr2c.scholar.serialssolutions.com/?sid=google&auinit=D&aulast=Behnami&atitle=Joint+registration+of+ultrasound,+CT+and+a+shape%2Bpose+s>

tatistical+model+of+the+lumbar+spine+for+guiding+anesthesia&id=doi:10.1007
/s11548-016-1369-4&title=International+journal+for+computer+assisted+radio
logy+and+surgery&volume=11&issue=6&date=2016&spage=937&issn=1861-6410

Citation #2:

<http://gw2jh3xr2c.scholar.serialssolutions.com/?sid=google&auinit=D&aulast=Behnami&atitle=Joint+registration+of+ultrasound,+CT+and+a+shape%2Bpose+statistical+model+of+the+lumbar+spine+for+guiding+anesthesia&id=doi:10.1007/s11548-016-1369-4&title=International+journal+for+computer+assisted+radio+logy+and+surgery&volume=11&issue=6&date=2016&spage=937&issn=1861-6410>

Citation #3:

https://www.cv-foundation.org/openaccess/content_cvpr_2015/html/Ng_Beyond_Short_Snippets_2015_CVPR_paper.html

Keyword #1:

Machine learning, deep learning

Keyword #2:

medical imaging

Dentistry



Name:

Arwa Zohair Gazzaz

Degree or Position:

Ph.D. Candidate

Institution:

UBC

Department:

Oral Health Science

Field of Research:

My field of research in the areas of oral health inequalities especially in children and adolescents, social determinants of oral health and translating knowledge from the behavioral and social sciences.

Quick summary of your research (200 words max):

Drawing on my training in dentistry and public health and my specific interest in social epidemiology, my research focuses on how people's dental diseases risk and behaviors are shaped by their social position, with a particular focus on children and adolescents. My dissertation focusses on understating social position-based health inequalities and their possible explanations with respect to three aspects of oral health in adolescents.

Summary of what you would like to do with your mentees (400 words max):

I am open to explore various research questions and projects pertaining to oral health/dental health in children and adolescent especially those questions looking at the intersection of dentistry, public health and sociology. Mentee with strong interest in either dentistry or/and public



health can benefit the most, as this kind of project will help them understand both fields with a different prospective. Based on the mentee basic interest, I will guide him/her through some basic readings to help formulate their research questions and build the literature review. Following that, mentee will have access to some available data to answer their research question and will receive appropriate guidance to conduct their own data analysis (using SPSS or Stata software) and write it up.

Citation #1:

Sisson KL. Theoretical explanations for social inequalities in oral health. *Community Dent Oral Epidemiol.* 2007;35(2):81-88. doi:10.1111/j.1600-0528.2007.00354.x.

Citation #2:

Calderon SJ, Mallory C. A systematic review of oral health behavior research in american adolescents. *J Sch Nurs.* 2014;30(6):396-403. doi:10.1177/1059840514544034.

Citation #3:

Chi DL, Broder HL, Warren J. Existing Paradigms and Current Challenges in Adolescent Oral Health Research: A Call for Health Promotion Research Focusing on Low-income Adolescents. *Pediatr Dent.* 2015;37(7):496-498.

Keyword #1:

oral health

Keyword #2:

dental public health, social oral epidemiology



Name:

Monica Emode

Degree or Position:

Master's

Institution:

UBC

Department:

School of Population and Public Health

Field of Research:

Mental Health

Quick summary of your research (200 words max):

I am a first year MSc candidate in the School of Population and Public Health. I completed my undergraduate degree in Psychology and I have spent a number of years working in various research hospitals and academic institutions. I am interested in utilizing a mixed-method approach to understand how we can enhance mental health service delivery and improve service coordination for children, youth and families who have difficulty accessing effective, person-centered services across Canada.

Summary of what you would like to do with your mentees (400 words max):

Public Health is a wonderful field for REX students to explore as its initiatives have lasting effects on everyone. Because this field is continuously evolving to meet the needs of the global community, it takes on an interdisciplinary approach to evaluate methods to prevent disease and promote health. Previous research has demonstrated that poor mental health can have lasting effects on your physical health and increase rates



of disease in certain populations. I am open to supporting students who have an interest in children and youth populations and are interested in working at intersection of psychology and public health. Although my research interests are focused on health service delivery, individuals with an interest in mental health policy are also encouraged to apply.

Students who work with me would be given direction on how to conduct a strong literature review, which will help inform our research question(s). It can be difficult to come up with a focused research question, but not to worry, our research question(s) will be refined using the literature. Depending on the nature of our research questions and our chosen methodology, there may be an opportunity to work with a dataset, otherwise we will predict our results. Students in my group will garner important research skills (i.e. how to write an abstract for a conference poster/oral presentation, interpretation and/or prediction of results etc.). I would also encourage anyone with an interest in pursuing a career at an academic research institution to join my group.

Citation #1:

https://www.mentalhealthcommission.ca/sites/default/files/2016-06/Investing_in_Mental_Health_FINAL_Version_ENG.pdf

Citation #2:

[https://doi.org/10.1016/S0140-6736\(07\)60368-7](https://doi.org/10.1016/S0140-6736(07)60368-7)

Citation #3:

nan

Keyword #1:

Medicine



Children and Adolescent Mental Health

Keyword #2:

Public Health



Name:

Ariel Ko

Degree or Position:

Master's

Institution:

UBC

Department:

Psychology

Field of Research:

Clinical Psychology

Quick summary of your research (200 words max):

My research interest is in developmental psychopathology, spanning areas of clinical, developmental, and social psychology. Currently, I am conducting a longitudinal study on the development of perfectionism in children and adolescents. Perfectionism is a maladaptive personality style where an individual demands unrealistic expectations from the self and others. When these expectations go unmet, the individual experiences intense feelings of shame and failure. Perfectionism has been shown to be associated with mental health issues, interpersonal challenges, poorer physical health, and even early death. As such, it is important that we look at what factors contribute to perfectionism so we can work towards resources for primary prevention and early intervention.

Summary of what you would like to do with your mentees (400 words max):

I am open to any research ideas in the field of social sciences. I highly encourage students to first take a look at the current literature in their



field of interest and come with ideas on how to fill the knowledge gap observed in the literature. Since we are working towards presenting at MURC in March, ideas for projects should not only be reasonable and feasible, but also original and impactful. Alternatively, I'm happy to have students take on research assistant roles in my current project to further foster their research skills and academic development.

Citation #1:

<https://www-sciencedirect-com.ezproxy.library.ubc.ca/science/article/pii/S0191886914007065>

Citation #2:

<https://www-sciencedirect-com.ezproxy.library.ubc.ca/science/article/pii/S0191886912000785>

Citation #3:

nan

Keyword #1:

Clinical Psychology

Keyword #2:

Developmental Psychopathology



Name:

Somayyeh Mohammadi

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Occupational Science and Occupational Therapy

Field of Research:

Health psychology, rehabilitation

Quick summary of your research (200 words max):

Hello, I have a PhD in health psychology and am working in UBC as a postdoctoral fellow. I'm interested in investigating the impact of chronic illnesses (e.g., chronic pain) and disabilities on the well-being of patients and their family members (e.g., partners, children). In addition, I'm also interested in studying how family members can help their member with a chronic illness to have a better well-being.

Currently, I'm working on a very innovative project regarding assessing the impact of pre-operative educations on patients' outcomes (e.g., infection, physical functioning) after a joint replacement surgery. In this project, we are interviewing patients and their family members to see what the current gaps in pre-operative educations are and how they would like to receive the pre-operative educations.

Summary of what you would like to do with your mentees (400 words max):

I would like to study how joint replacement surgeries impacts patients and



their family members and how family members can help their patientsâ€™ rehabilitations. However, Iâ€™m open to any ideas that are relevant to my research interests (i.e., chronic illness and disability, family interactions, and rehabilitations).

If you have your own ideas, which I believe is great, I can help you with developing a personal research strategy and a plan to achieve your research goals. I will monitor your achievement and provide feedback on your progress. I will give you constructive feedback and help you to understand the barriers that you may face during conducting a research study and more importantly, I will do my best to overcome those barriers together. I will read your papers and provide comments on them in a timely manner and I will help you to draft an abstract and present it in the Multidisciplinary Undergraduate Research Conference (MURC).

Citation #1:

Mcdonald, S., Mj, P., Beringer, K., Wasiak, J., & Sprowson, A. (2014). Preoperative education for hip or knee replacement (Review) SUMMARY OF FINDINGS FOR THE MAIN COMPARISON, (5).
<https://doi.org/http://dx.doi.org.libproxy.lib.unc.edu/10.1002/14651858.CD003526.pub3>

Citation #2:

Mohammadi, S., de Boer, M. J., Sanderman, R., & Hagedoorn, M. (2017). Caregiving demands and caregivers psychological outcomes: The mediating role of perceived injustice. *Clinical Rehabilitation*, 31(3), 403â€“413.
<https://doi.org/10.1177/0269215516643846>

Citation #3:

Mohammadi, S., Dehghani, M., Sanderman, R., & Hagedoorn, M. (2017). The role of pain behaviour and family caregiver responses in the link between



pain catastrophising and pain intensity: A moderated mediation model.
Psychology & Health, 32(4), 422–438.
<https://doi.org/10.1080/08870446.2016.1275628>

Keyword #1:

Chronic illnesses, disability, rehabilitation

Keyword #2:

Family members, caregivers, well-being, quality of life



Name:

Kevin McCartney

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Geography

Field of Research:

Fossil capitalism and social energy transitions

Quick summary of your research (200 words max):

My research looks at energy transition efforts in Canada from a social and critical lens. I examine the underlying ideologies and power relations behind Canada's policy efforts to combat climate change, and I talk to everyday Canadians who live and work in oil and gas extraction communities about their ideas for a more democratic and sustainable future. Along the way, I try to address the structural, cultural, and emotional barriers to making a livable planet.

Summary of what you would like to do with your mentees (400 words max):

I have two ideas for our work together and I leave open the possibility of a different option we arrive at collaboratively. I would like you to extend my research into a group called Smart Prosperity, which is a think tank in Canada that has deep ties to the Trudeau government and helped develop the federal government's energy policy (including its pipeline plan, carbon taxes, and more).



Option 1: We can propose (or even conduct!) a critical discourse analysis on some of Smart Prosperity's policy documents. Topics we can choose include carbon taxation, biodiversity loss, cleantech sector investment, or green bonds. This would require that you read about the method of critical discourse analysis, the theory on social meaning and discourse, and the content area we choose. If we decide to conduct the study together, we would then go on to analyze Smart Prosperity's public material using our understanding of the method, theory, and content area.

Option 2: We can propose (or conduct!) a network analysis on the relationships between members of Smart Prosperity, members of government, and members of energy corporations to examine the reach of those corporate actors into civil society through Smart Prosperity. This would also require reading in three areas: about the method of network analysis, the theory on how corporations wield power, and the content of how the state functions through these networks of relationships. If we go on to conduct the study, we would access public records to "map" the relations between these actors.

In either case, I would like to see you develop a presentation at the MURC conference in March 2019, and we will work backward from there to develop timelines that are reasonable and achievable. Should we decide as a group to actually conduct your proposed study, we can discuss moving on to



publish in one of UBC's undergraduate journals (such as Sojourner or CJUR).

All of that said, I am still very open to other ideas for research in my fields of critical geography, social and political ecology, and energy transition.

Citation #1:

<http://dx.doi.org/10.1111/cars.12211>

Citation #2:

<https://doi.org/10.1111/1471-0374.00049>

Citation #3:

<https://dspace.library.uvic.ca//handle/1828/10001>

Keyword #1:

Political ecology

Keyword #2:

Social energy transitions



Name:

Durjoy Baidya

Degree or Position:

Master's

Institution:

UBC

Department:

Mining Engineering

Field of Research:

Energy management in remote mining

Quick summary of your research (200 words max):

Remote mining operations and the communities are using large-scale diesel generators for the power generation due to their off-grid location. These large power generation units discard one-third of their diesel input as waste heat through their exhaust. Moreover, they burn diesel and other fossil fuels to provide heating to during their long winters. My research is to capture the heat from the exhaust of those generators and store with proper energy storage system and supply "Green" heat to the communities and mining operation when needed. This way a huge amount of carbon credits will be saved, and the energy system will be more sustainable. This my current research ongoing. I have also experience of working on projects on biodiesel, Stirling engine and CO2 sequestration.

Summary of what you would like to do with your mentees (400 words max):

I believe the most important and often neglected part in case of a research is reviewing the existing literature. A systematic approach can

save a lot of time and labor from being wasted, if applied on literature review. At the very beginning of this mentoring process, I would like to show my mentees a proper structure through which they can successfully complete their literature review with joy.

From my experience, I have realized, a regular touch-base meeting always helps to keep everything under radar and on the way. I will encourage my mentees for regular (weekly) meeting so that both of us can create our own language to work.

Water and energy are the two issues which have all the potentiality to be crisis at any moment. Any project which is trying to brand sustainability in these two sectors I am really interested to study with the students. In case of projects related to alternative source to conventional energy or synergy between them, I can bring my experience from working several energy related projects on the table. Coming from a developing country has made me a person who is really concerned about the water issues. For my personal interest, I keep myself occupied with the latest development in the field of water management and purification. If I get the opportunity to mentor a group that is working on water related projects I can use this knowledge to give them some head-starts.

Apart from these two sections, I am also eager to work on project which are trying to societal valuation of big infrastructure or technology. How a company which is running top-notch projects dealing with the stakeholders, environment and society " projects on these topics will give me pleasure to work on.



Citation #1:

<https://www.sciencedirect.com/science/article/pii/S1877705814028756>

Citation #2:

<http://www.mdpi.com/1996-1073/10/6/743/pdf>

Citation #3:

<https://www.sciencedirect.com/science/article/pii/S1876610215010929>

Keyword #1:

Energy storage

Keyword #2:

Heat recovery

Name:

Saumya Shandilya

Degree or Position:

Master's

Institution:

UBC

Department:

Electrical and Computer Engineering

Field of Research:

Continuous Validation and Verification, Intelligent selection of regression tests, AI driven test automation, Regression Testing, Change Impact Analysis, IBM Watson platform for health

Quick summary of your research (200 words max):

Hello! I am a M.A.Sc. student in Electrical and Computer Engineering working on the Change impact analysis for the IBM Watson platform for health.

Regression testing is the portion of the testing life cycle during which program P has been modified into P' . This needs specific testing attention to ensure that the modified code behaves correctly and the code carried over unchanged, continues to behave correctly. However, an important problem is that regression testing constitutes the vast majority of testing effort in many software development environments. Change Impact Analysis can be used to reduce the cost of regression testing by determining the parts of a program that need to be re-tested after a

change is made. I would be working on creating scripts with AI and machine learning for doing Impact analysis of individual changes and selection of common services / micro services that need to be retested.

Summary of what you would like to do with your mentees (400 words max):

I am currently working on Continuous validation and verification for the IBM Watson platform for health. However, I am open to discussion and helping my mentees work on specific projects.

Citation #1:

<https://onlinelibrary.wiley.com/doi/abs/10.1002/stvr.430>

Citation #2:

<https://dl.acm.org/citation.cfm?id=1029012>

Citation #3:

nan

Keyword #1:

Continuous Validation and Verification, Intelligent selection of regression tests, AI driven test automation, Regression Testing, Change Impact Analysis, IBM Watson platform for health

Keyword #2:

Continuous Validation and Verification, Intelligent selection of regression tests, AI driven test automation, Regression Testing, Change Impact Analysis, IBM Watson platform for health

Name:

Saeid Allahdadian

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Computer science

Field of Research:

Artificial intelligence

Quick summary of your research (200 words max):

My research is about the use of artificial intelligence for making the cities smarter. This can be applied to the security, transportation and natural hazard mitigation of cities and people living in cities. This is the first step towards making an environment managed by machines and computers to decrease the traffic, violence and the emergency response time.

Summary of what you would like to do with your mentees (400 words max):

I will see what they like to focus on and how I can align my interests with them. So I am almost flexible.

Citation #1:

https://dsi.ubc.ca/sites/dsi.ubc.ca/files/dssg_final_report_open_transit.pdf
read chapter 5

Citation #2:

https://www.ibm.com/smarterplanet/us/en/smarter_cities/overview/

Citation #3:

nan

Science



Keyword #1:

Artificial intelligence

Keyword #2:

Machine learning



Name:

Alyssa Henderson

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Chemistry

Field of Research:

Chemical Biology

Quick summary of your research (200 words max):

I work on the chemistry of natural products isolated from soil bacteria. Natural products are molecules produced by living organisms, and many of them have important applications in medicine and industry. My work involves looking at the DNA sequences of various strains of bacteria to find clusters of genes that might create interesting products. I also do protein crystallography work to understand how enzymes create these natural products.

Summary of what you would like to do with your mentees (400 words max):

I am interested in allowing my mentees to shape the project in their own direction, as I think that developing a project yourself is a very useful experience. I am always available by email for questions, and can happily meet with my mentees weekly for project updates and guidance. One area of research in my field that interests me is creation of novel natural products using techniques borrowed from synthetic biology. For example, if



we can switch out certain enzymes in a biosynthetic pathway, can we install new functional groups to create modified products? Can we tune the expression of various enzymes in a pathway to make a mix of natural products, or optimise the rate of synthesis?

Citation #1:

<https://www.nature.com/articles/s41467-018-04254-0>

Citation #2:

<https://pubs.acs.org/doi/abs/10.1021/sb5003218>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/26000872>

Keyword #1:

Chemical Biology

Keyword #2:

Protein Chemistry

Name:

Francesco D'Acierno

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Chemistry

Field of Research:

Applied Science

Quick summary of your research (200 words max):

Investigation and improvement of the thermal stability of cellulose nanocrystals and cellulose laments through a multianalytical approach (ssNMR, PXRD, TGA, DSC, FTIR, SEM, ...)

Summary of what you would like to do with your mentees (400 words max):

Investigation of the optical properties of cellulose nanocrystal (CNC) lms as a function of temperature, pressure, external electric and magnetic elds and other parameters. The project would involve initially an experimental part, including mainly UV-VIS and CD spectroscopy, and then a theoretical part, where the development of models are carried out through computational methods. The helical pitch of the CNC self-assembly leads to a chiral nematic structure, which reects the wavelengths corresponding to visible light. Such pitch is modied



when external factors are applied, changing the colors visible on the surface. This project may yield the development of tunable optical devices, which would have also interesting properties of biocompatibility and large abundance considering the cellulose nature.

Citation #1:

<https://onlinelibrary.wiley.com/doi/abs/10.1002/macp.201200351>

Citation #2:

<https://pubs.acs.org/doi/10.1021/am501995e>

Citation #3:

<https://pubs.acs.org/doi/abs/10.1021/bm034519%2B>

Keyword #1:

Bio-inspired photonics

Keyword #2:

Cellulose

Name:

Hamed Helisaz

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Mechanical Engineering

Field of Research:

Cancer Diagnosis

Quick summary of your research (200 words max):

I am working on Prostate Cancer Diagnosis. My research goal is to develop a miniature sensor to detect the hardness of the prostate gland. The sensor sticks to the tissues surrounding prostate gland, which are accessible through the rectum, and checks their stiffness. Abnormal stiffness indicates the presence of cancer.

Summary of what you would like to do with your mentees (400 words max):

In my Ph.D. research, I am working on the application of sensors in cancer detection. In REX program, I want to try using sensors in marine robotics. The ability to work inside the water makes marine robots fit for many applications, ranging from oceanography to offshore inspection. I am interested in developing robotic fishes. I believe this topic provides an opportunity for undergraduate students to go above and beyond of what is expected of them, and so it is suitable for the REX program. Also, the involved challenges in developing such a robot fulfill the learning



purposes of the REX program. Specifically, I am interested in developing robotic fish with the purpose of seawater sampling. Such a robot can provide a wide range of samples in various water depths and distance from shore. About the timeline, while it requires the project to be defined in more detail, I think the project can be carried out within six months.

Citation #1:

<https://www.sciencedirect.com/science/article/pii/S0925400516307687>

Citation #2:

<https://www.sciencedirect.com/science/article/pii/S0003267017310395>

Citation #3:

<https://www.sciencedirect.com/science/article/pii/S000925091830455X>

Keyword #1:

Bionic Robotics

Keyword #2:

Sensors, Controllers, and Actuators



Name:

Julia Huggins

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Microbiology & Immunology

Field of Research:

Microbial Biogeochemistry

Quick summary of your research (200 words max):

I study how microorganisms effect environmental chemistry by metabolizing carbon, nitrogen, and sulfur compounds. Specifically, I focus on microorganisms that carry out processes in the nitrogen cycle in anoxic marine environments. I study both the genetic composition of microbial communities to identify the key players and interactions between them. I also conduct laboratory experiments with live microbial communities to measure the real-time rates of nitrogen cycle processes in these environments. I will use this information to improve models of oxygen dynamics in marine environments by elucidating the roles of microorganisms.

Summary of what you would like to do with your mentees (400 words max):

I am open to exploring a variety of biogeochemistry-related questions. One option is to focus on processes specific to the nitrogen cycle in anoxic marine environments. We have significant background information on anoxic



marine environments in the BC region, which would provide a platform for a very specific and focused research project. With this approach, we would review the existing literature on these environments and develop two or three specific hypotheses about nitrogen-cycle dynamics (e.g. response to oxygen levels, competition between microorganisms, or nutrient requirements). Alternatively, if the students are interested in other aspects of biogeochemistry, we can propose a more exploratory project. The field of biogeochemistry is largely unexplored, which leaves a lot of room for exploration. A few examples of alternative environments potentially of interest include: anoxic lake basins in Indonesia, nutrient-depleted moss bogs in Alaska and Patagonia, and human engineered environments such as wastewater treatment plants or mine wastewater. If we take a more exploratory approach, I would expect we would take a bit more time on the literature review to develop research questions and methods. We would still focus on specific hypotheses, but we would have to spend more time exploring possible research questions and thinking creatively about what type of information/measurements would be the most informative to collect and how we could accomplish it in these unexplored and/or difficult-to-access environments.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/18497287>

Citation #2:

<http://www.pnas.org/content/113/40/E5925.short>

Citation #3:

<http://www.pnas.org/content/early/2014/07/22/1322132111.long>

Science



Keyword #1:

Microbiology

Keyword #2:

Environment



Name:

Rishad Habib

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Marketing and Behavioural Studies

Field of Research:

Consumer Behaviour

Quick summary of your research (200 words max):

I study ethical and prosocial consumer behaviour which includes donating money to charity, acting sustainably, purchasing fair trade chocolate or signing a petition to lower carbon emissions. I find our constant struggle to be moral people while also maintaining our own self interests fascinating. I am particularly interested in how changing norms and social pressures influence broader transformations in what it means to be a "good" person. For instance in one project I look at how certain consumers react negatively to moral labels that they do not identify with. In general I use experimental methods to answer these questions but I would be open to other methods including scraping data and analyzing existing datasets.

Summary of what you would like to do with your mentees (400 words max):

I am open to a range of projects that look at improving consumer lives and decision making including aspects that may not directly tie in with my



current research.

I would expect the process to begin with identifying research interests and literature that is important to review. Once this is read and discussed we should be able to formulate a more precise research question and upon further reading, specific hypotheses. We can then design methodology to test these hypotheses, collect data and analyze it to see our results.

Citation #1:

<http://davidhardisty.info/downloads/SHIFT-manuscript-V2.docx>

Citation #2:

<https://www.tandfonline.com/doi/abs/10.1080/19416520.2014.911576>

Citation #3:

<https://academic.oup.com/jcr/article/43/4/567/2630509>

Keyword #1:

consumer behaviour

Keyword #2:

ethics and sustainability



Name:

Cara Ellis

Degree or Position:

Postdoctoral Fellow

Institution:

UBC

Department:

Cellular & Physiological Sciences

Field of Research:

diabetes, stem cells, cell biology

Quick summary of your research (200 words max):

Diabetes, characterized by high blood sugar levels, is a result of insufficient insulin production from cells in the pancreas, called β^2 cells. People with diabetes require frequent daily injections of insulin and regular measuring of blood glucose levels to attempt to minimize large glucose fluctuations. High blood glucose causes serious long term complications, but too much insulin can lead to low blood glucose levels, which can cause coma, and if untreated, death. In the Kieffer lab, we believe that the best therapies for diabetes will come from approaches that re-establish automatic, cell-based release of insulin. Clinical studies involving transplant of pancreatic islets validate the effectiveness of this approach. Islets are small clusters of hormone producing cells, including the insulin producing β^2 cells. However, there is insufficient islet supply for all patients with diabetes as these cell clusters come from cadaveric donors. Stem cells have the ability to



multiply, and to become all cell types of the human body, and are therefore a potentially unlimited source of insulin-producing cells that could treat patients with diabetes. My work involves different approaches towards generating a functional therapy for patients with diabetes, including how and where to implant the cells as well as characterizing the biology of the stem cell-derived insulin-producing cells.

Summary of what you would like to do with your mentees (400 words max):

The Kieffer lab (<https://kiefferlab.com/>) has expertise in a variety of different techniques, including model cell lines, differentiated stem cells, zebrafish and genetically engineered rodents. I would be open to any theoretical research project related to diabetes, from \hat{I}^2 cell insulin secretion and glucose signalling to pre-clinical testing of potentially therapeutic products. If potential mentees have specific research questions in this field, I will facilitate project design to answer these questions. If not, we would work as a group to discover a topic of interest following a literature review.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pubmed/10911004>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pubmed/25211370>

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/28811674>

Keyword #1:

diabetes

Keyword #2:

stem cells

Medicine



Name:

Graham G Macdonald

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Rehabilitation Sciences

Field of Research:

Medical Sociology

Quick summary of your research (200 words max):

I am studying how patients and the public engage as partners on research teams in health research. In particular, I am interested in how the power dynamics in the struggle for credibility between patients and researchers influence and shape the process. I am also interested in structural and economic inequities that may contribute to making engagement in research difficult for many. My research follows a qualitative methodology and engages with medical anthropology/sociology, health services research, science and technology studies (STS), social movement studies, and the political economy of health.

Summary of what you would like to do with your mentees (400 words max):

I would like to facilitate an exercise in qualitative medical sociology. My mentees would formulate a question related to the experience of a health-related issue (can be anything from how cancer remission affects daily life to how people think about or use the health apps on their



smartphones). I will guide my mentees in shaping a research question and choosing a methodological framework, carrying out data collection through interviews or focus groups, applying to a research ethics board for approval, and engaging with sociological theory in the interpretation of their findings.

Citation #1:

<https://bmjopen.bmj.com/content/8/8/e022154>

Citation #2:

https://seeingcollaborations.files.wordpress.com/2014/08/epstein_impure-science1996.pdf

Citation #3:

<https://www.ncbi.nlm.nih.gov/pubmed/15027990>

Keyword #1:

Medical Sociology

Keyword #2:

qualitative health research



Name:

Jennifer Lin

Degree or Position:

Master's

Institution:

UBC

Department:

Medical Genetics

Field of Research:

Pharmacogenomics of Adverse Drug Reactions

Quick summary of your research (200 words max):

I work in at the BC Children's Hospital in a lab that specializes in looking at adverse drug events (i.e. side effects) of a large variety of drugs from chemotherapy to anti-virals. The goal of our research is to predict which individuals are the most likely to develop serious side effects to taking drugs, which include heart defects, hearing loss, severe anemia to name a few. Our predictions are for the most part genetic based, meaning we are looking for gene markers that might indicate whether an individual will be likely to succeed in treatment or may be more prone than another individual to developing a serious reaction.

Summary of what you would like to do with your mentees (400 words max):

I would like to guide my students on a project which involves learning some basic bioinformatics/statistics related programming. Examples would include doing some basic statistics in R on open-source data or developing/modifying a pipeline for doing bioinformatics analysis. The



project would involve 1/3 literature search where the group would get the opportunity to explore literature and possibly databases of curated cohorts (of genetic or proteomic data) to come up with a gap in the current field of knowledge that they would like to fill. The largest portion of the time would be dedicated to planning how they propose to fill that gap (i.e. do some of their own research, or creating a program/function) and generate the steps that they plan to take to do said project. The last part would be to potentially put that plan into action to see if any data could be generated and to develop a report based on what is done.

Citation #1:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3217465/>

Citation #2:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC261895/>

Citation #3:

nan

Keyword #1:

bioinformatics

Keyword #2:

genetics



Name:

Emel Islamzada

Degree or Position:

Master's

Institution:

UBC

Department:

Pathology and Laboratory Medicine

Field of Research:

Red Blood Cell Research, Biomedical Engineering

Quick summary of your research (200 words max):

The overall goal of Multi-scale Design Lab (MDL) is to develop novel technologies for disease treatment and medical research. My research focuses on application of our technologies to Red Blood Cell research.

Human red blood cells (RBCs) are about $8 \mu\text{m}$ in diameter on average. They have a remarkable ability to fold and deform to a size as small as $2 \mu\text{m}$ when traveling through microvasculature. This ability is essential to their proper function. A number of conditions such as sickle cell anemia, malaria, or storage lesion, are associated with reduced deformability of RBCs.

Our lab focuses on utilizing biomechanical properties of RBCs as a potential biomarker for stored cell quality. Morphologic and structural changes that occurs during cold storage of RBCs, affects their deformability. We have developed a Microfluidic Ratchet Device that is able to separate RBCs based on their ability to deform, allowing us to



look at disease pathologies from a new, biomechanical perspective.

Summary of what you would like to do with your mentees (400 words max):

The mentees will have a chance to learn about exciting technologies behind the projects we are working on, and focus on biomedical aspect of the projects. Last year, we looked at possible treatment ways for Plasmodium malaria. This year, the project will encompass the area of red blood cell storage. We will start by surveying the literature and learning a little bit about what is known about the way the RBCs change as they are stored, and what are the current challenges in the field. From there, the mentees will pick an area of interest, and we will do further research to focus on a specific research question, which will become the centre of the subsequent project. I am very open to various projects projects that can be done with this topic, bring me your ideas!

Citation #1:

<https://www.sciencedirect.com/science/article/pii/S0021929015005485>

Citation #2:

<http://pubs.rsc.org/en/content/articlelanding/2016/lc/c5lc01248a/unauth#!divAbstract>

Citation #3:

<https://www.nature.com/articles/s41598-017-06865-x>

Keyword #1:

red blood cell storage

Keyword #2:

bioengineering

Name:

Jihoon Lim

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Mechanical Engineering

Field of Research:

Control system

Quick summary of your research (200 words max):

My research is to design Selective Catalytic Reduction (SCR) Control system which is part of the after-treatment system in heavy-duty diesel engines. The Main purpose of SCR control systems is to reduce NOx with affordable NH3 slip.

Summary of what you would like to do with your mentees (400 words max):

I would like to support them to understand how to implement a system model and design a controller based on optimal control techniques on a simulation basis. (Matlab & Simulink)

Citation #1:

http://www.bosch.co.jp/tms2015/en/products/pdf/DS_ProductDatasheet_Denoxtronic5_EN.pdf

Citation #2:

https://www.mtu-online.com/fileadmin/fm-dam/mtu-global/technical-info/white-papers/3100691_MTU_General_WhitePaper_SCR_2014.pdf

Citation #3:



http://www.cdti.com/pdf/cdti_deer_2008_srg-scr_presentation.pdf

Keyword #1:

Internal Combustion Engine

Keyword #2:

SCR control system

Name:

Samuel Akinbo

Degree or Position:

Ph.D.

Institution:

UBC

Department:

Linguistics

Field of Research:

Phonology, Language Documentation, Phonetics, Speech Surrogacy

Quick summary of your research (200 words max):

I work on phonology of understudied and endangered languages. Presently, I work on Fungwa, a endangered Kainji language with about 1000 speakers in Niger state, Nigeria. In addition to endangered languages, I also work on speech surrogacy. Specifically, my research interest is on how linguistic knowledge is synthesize with indigenous musical instrument.

Summary of what you would like to do with your mentees (400 words max):

Mentor a student with interest in endangered languages. Specifically, the student will learn about language documentation and phonology.

Citation #1:

Bird, Steven and Simons, Gary. 2003. Seven dimensions of portability for language documentation and description. *Language*, 557-582

Citation #2:

McGill, Stuart and Blench, Roger. 2012. Documentation, development, and ideology in the northwestern Kainji languages. *Language Documentation and Description*, 90-135

Arts



Citation #3:

nan

Keyword #1:

Linguistics, Phonology, Endangered language, Documentation

Keyword #2:

Linguistics, Phonology, Endangered language, Documentation

Name:

Stanley Chia

Degree or Position:

Master's

Institution:

UBC

Department:

History

Field of Research:

19th and 20th century Asian and European political history, colonialisms in Asia etc

Quick summary of your research (200 words max):

My thesis is about how the post-colonial Malaysian state dealt with their ethnic Chinese population during the 1960s, shortly after having achieved independence from Britain in 1957. I work with archival documents, primary sources, and oral life history interview transcripts (some original, some from the archives). My research intersects with British colonial history, Southeast Asian historiography, and decolonization in the global south

Summary of what you would like to do with your mentees (400 words max):

Tell them about how and why history is important, feature southeast asian history and issues as topics of global relevance, and thinking about ways in which our understanding of the past can shape how we think about our future. I have some experience with French colonial history, particularly Vietnam, as well as an International Relations background, so I am comfortable in discussing most world issues in the 20th century.



Citation #1:

2011 world bank report on Malaysia's brain drain

Citation #2:

Chia, Stanley. "Of Being Bold and Fortunate". Pathways: Asian Pathways Research Lab Publication no. 1, vol. 1, 2017.

Citation #3:

nan

Keyword #1:

History

Keyword #2:

Political Science