

2023 Scholar Award Recipients

Award Recipient	Host Institution / Research Location	Project Title	Lay Summary
Kirk Bergstrom	University of British Columbia – Okanagan Campus	Mucus-directed therapeutics to prevent and treat chronic microbiota-dependent diseases of the gut	<p>The colon is teeming with life, not just due to our own cells, but also due to a rich and diverse community of microbes. Remarkably, this community is a virtual organ, helping to digest food and fight inflammation. Unfortunately, this "organ" can malfunction and cause chronic diseases like inflammatory bowel disease (IBD), which affects thousands of Canadians. How to promote the benefits and prevent the harmful activities of our microbiota is a central question. One major factor is gut mucus, a sugar-rich gel-like layer that surrounds the microbiota to act as a barrier to prevent their invasion. This mucus layer is defective in IBD. The objective of my research is to develop new ways to capture the protective power of human mucus to prevent and cure IBD. To do this I will use a new approach my lab developed to extract and purify human mucus to test its protective abilities in mouse models of IBD. We will also learn how microbes control mucus production so we can target these pathways in patients. Last we will use human colon cells to generate a "mucus factory" that can produce mucus with enhanced protective properties. The results of this research will illuminate new paths to restore healthy host-bacteria relationships in IBD.</p>
Chris Buse	Simon Fraser University	BC REACH (BC Research on Equitable Adaptation to Climate and Health)	<p>The flood, fire and heat events of 2021 brought the health impacts of climate change into focus for British Columbians. New public health interventions are required to support effective adaptation, but especially for the most impacted population groups. The BC-REACH (BC Research for Equitable Adaptation to Climate and Health) project is a mixed-methods research platform to build evidence on effective and equitable public health adaptation to climate change. The project's goal is to equip public health practitioners and residents of British Columbia (and beyond) with new evidence and interventions to enhance their preparedness to a variety of climate change-related health risks. Working in partnership with applied health system partners, this research will ultimately lead to the co-development and evaluation of novel programs and policies that have multiple co-benefits for populations that may be more exposed or physiologically sensitive, or lack the capacity to adapt to a changing climate. By centring equity in this analysis, this research will build knowledge and capacity to reduce population-level health inequities by "climate proofing" the future of the health system's responses to a wide variety of climate and health risks.</p>
Kaylee Byers	Simon Fraser University	Bridging the gaps: a one health communications framework for mobilizing knowledge at the nexus of human,	<p>Health is connected and collective. Connections across species and geographies promote the spread of infectious diseases. Collectively, humans, animals, and environments face shared health threats like climate change. This concept of "One Health" is a valuable lens through which to identify actions that support a healthy world. Yet, One Health's major strength is also its largest challenge as it relies on bridging disciplinary silos -- veterinarians and doctors, policy makers and public health practitioners, scientists and the public. My community-engaged research explores a framework for mobilizing information at this nexus of health.</p>

		animal, and environmental health	Working with policy makers, health practitioners, and communities, I will identify communication structures that can be deployed at regional scales and across sectors. By understanding community knowledge and perceptions of three One Health issues (chronic wasting disease, avian influenza virus, and rat-associated diseases), I will resolve how health messages can be strengthened to promote public participation in disease surveillance programs. Engaging with knowledge users at all levels will help to improve data collection, monitoring, and inform government decision making and timely action.
Nancy Clark	University of Victoria	Promoting integrated mental health care services and supports for refugees in BC	Approximately 84 million people worldwide were forcibly displaced during 2021, including refugees, who have been forcibly displaced by conflict. It is estimated that one in five people in settings affected by conflict have a mental disorder. Evidence shows that many refugees require mental health support post migration as a result of trauma, and post migration stress. Mental health conditions such as depression, anxiety, post traumatic stress disorder, and psychosis are much more prevalent among refugees than among host populations. Post migration, refugee mental health is determined by stressors of acculturation such as employment, housing and access to health care. Limited knowledge exists on how mental health services work to promote refugee mental health in high income countries like Canada. Barriers to mental health care include service fragmentation and provider knowledge about the determinants of refugee mental health. The goal of my research is to develop and conduct an evaluation of existing mental health services and supports for refugees in BC. Findings will inform primary health care services, mental health services and settlement services about what promotes integrated mental health care for refugees in BC.
Brittany Dennis	University of British Columbia BC Centre on Substance Use, Providence Health Care, St. Paul's Hospital Partners: St. Paul's Foundation / BC Centre on Substance Use	The Road to Recovery Initiative (R2RI): a prospective evaluation of a novel program for the delivery and coordination of addiction care in a Canadian setting	The consequences of substance use have had a devastating impact on British Columbia's (BC) healthcare system. Since the declaration of the province's public health emergency in 2016, over 10,000 British Columbians have died from an overdose. The lack of a coordinated addiction treatment system provincially is a significant contributor to BC's present state. To address this, Providence Health Care is implementing the Road to Recovery Initiative (R2RI), an innovate model of care to address two aspects of BC's addiction treatment crisis through 1) increasing access to on-demand addiction care; and 2) reorganizing existing clinical services to support patients at every phase of recovery. The proposed program of research seeks to evaluate key health and social outcomes associated with the implementation of R2RI. Participants of this program will be followed for five years with data collection focused on substance use, illness trajectory, community engagement, health care utilization, health risk behaviours, quality of life, overdose and death. Knowledge gained through this research will identify outcomes associated with the provision of a coordinated addiction treatment system and will inform successful scale-up of this new approach.

Annie Duchesne	University of Northern British Columbia	Beyond sex and gender: advancing a biosocial understanding of affective processes	Affective processes such as stress and emotion are at the heart of how we understand ourselves and interact with the world around us. Human and animal research supports the role of sex and gender-related factors in affective processes; however, the neurobiological mechanisms that influence affective processing remain unknown. While sex and gender are traditionally defined, respectively and separately, as biological and social dimensions of a person, alternative approaches rooted in interdisciplinary research rather conceptualize our biologies as inseparable from our social experiences. The proposed program of research aims to explore how an interdisciplinary gender/sex approach (as opposed to the distinct gender and sex approach) influence the neurobehavioural processes of stress and emotion. This research will expand our understanding of how context shapes biological and subjective experiences of stress and emotion and advance the development of integrated theories that will shape the future of gender/sex research.
Rebecca Feldman	University of British Columbia – Okanagan Campus	Evaluating microstructural changes in multiple sclerosis with magnetic resonance imaging	Multiple Sclerosis (MS) can be difficult to detect, diagnose and treat. It is often initially assessed by excluding other potential disorders and diseases as well as (where possible) a confirmatory magnetic resonance imaging (MRI) exam. While MRI can confirm the presence of MS lesions in the brain, the exam is of limited use in explaining or predicting symptoms or prognosis. Following the initial diagnosis, there are a number of medications that can be used to attempt delay the progression of the disease. However, it is challenging to assess the efficacy of a particular course of treatment unless disease progression is detected through the accumulation of additional disability or a follow-up MRI exam confirms the presence of new lesions. There may be other changes to the brain which may help scientists and physicians to understand how and why MS progresses and identify how well medications are working for a particular individual. Thus, the objective of this work is to leverage the power of a safe, non-invasive, imaging tool (MRI) to detect and evaluation changes to the brain that can help us better treat patients with MS.
Devon Greyson	University of British Columbia	Improving health information interventions to foster vaccine confidence and cultural safety of vaccination services	From monkeypox to measles, vaccination is essential to controlling infectious disease. COVID vaccines alone saved approximately 20 million lives in the first year. However, barriers to vaccination -- including inaccessibility, lack of confidence in vaccine safety or effectiveness, and distrust in those providing vaccination -- threaten our ability to stop epidemics. My program of research applies unique interdisciplinary expertise in information science and population health to investigate how we can use information to reduce vaccination barriers. Over the next five years I will conduct a suite of studies aiming to improve population health interventions focused on vaccine communication and surveillance. Studying how people use information and how vaccine communication and surveillance affects people in real-life contexts will help us meet needs of co-parents who disagree about child vaccination, people deciding whether to get new vaccines, and members of marginalized groups targeted by vaccination campaigns. It will generate evidence on how technologies can best be used for identifying and sharing information with vaccine hesitant people. Ultimately, this knowledge will improve vaccine uptake and reduce disease burden and inequity.

Brett Hilton	University of British Columbia International Collaboration on Repair Discoveries (ICORD)	Targeting neuronal maturation to promote axon regeneration after spinal cord injury	<p>Spinal cord injury leads to permanent and severe paralysis and loss of sensation. The principal reason for this is that nerve cells connecting the brain with the rest of the body lose the capacity to regenerate their processes (axons) as they mature during development. Despite decades of progress, no regenerative therapy for the injured spinal cord is available today, making a regenerative treatment for spinal cord injury a major unmet need of the British Columbia healthcare system. In this project, we will focus on the fundamental processes through which maturation suppresses axon regeneration. We have discovered a molecular switch that is turned off in mature neurons and that we hypothesize is critical for nerve cells to regrow axons. We will study how this molecular switch is turned off during maturation, the processes that it controls to enable growth and test whether re-activating it in mature neurons can promote regeneration and functional improvements following spinal cord injury. Collectively, this work will provide critical insight into why mature nerve cells fail to regenerate. We anticipate that this work will be a major steppingstone towards the development of a treatment that regenerates the injured human spinal cord.</p>
Ryan Hoiland	University of British Columbia	The oxygen cascade as a therapeutic target in humans with hypoxic-ischemic brain injury	<p>During a cardiac arrest the heart stops beating and blood flow to the brain stops, starving the brain of oxygen and causing a brain injury. In resuscitated patients whose heart starts beating again, this brain injury is the number one cause of death. As no therapies are available to treat this brain injury, my research will determine ways to improve the treatment of post-cardiac arrest patients with a brain injury. My research will use measurement probes placed directly in brain tissue as well as the analysis of blood entering and leaving the brain in humans to: 1) determine how to restore optimal oxygen levels in the brain; 2) develop tests to identify patient specific factors underlying low brain oxygen levels that can then help guide personalized patient care; and 3) investigate the molecular mechanisms of this brain injury. This work will be foundational to the development of new therapies to treat brain injuries caused by low oxygen levels in the brain. By determining widely implementable techniques to identify how oxygen delivery is impaired at the bedside, we will be able to tailor care in central and rural settings within British Columbia and provide patients with the specific treatments that work best for them.</p>
Tao Huan	University of British Columbia Djavad Mowafaghian Centre for Brain Health	Development of metabolomics to interrogate the effects of maternal sugar overconsumption on pregnant rats and their offspring	<p>Sugars such as sucrose (table sugar) are extremely common in the diet, in Canada and across the world. The World Health Organization advises that added sugars should make up 5 percent or less of daily calories for adults, and even less for children under two years. However, in Canada, adults and children often greatly exceed these recommendations. Of particular concern, added sugars during early development might have major and long-lasting effects on hormones, neural circuits, and behaviour. Our work is to develop sensitive and robust metabolomics technology to identify the key sugar products and other chemicals that play a key role in this biological process. This work allows us to understand the molecular basis between sugar intake and the long-lasting effects on adult offspring. The results will have important implications for the health of Canadians because very little is known about how mother's sugar intake affects the baby health and diseases.</p>

<p>Kate Jongbloed</p>	<p>Provincial Health Services Authority BC Centre for Disease Control, BC Office of the Provincial Health Officer</p>	<p>Growing an unlearning and undoing white supremacy and Indigenous-specific racism lab for population and public health in BC</p>	<p>First Nations, Métis and Inuit Peoples have a right to health. Laws in BC affirm this right. Settler systems have not yet fulfilled our obligations. The 2020 In Plain Sight report showed that Indigenous-specific racism in health is widespread in BC. This report, and others like it, outline clear instructions for health leaders. How should organisations responsible for population and public health in BC pick up these instructions? We often hear, "what can we do?" This research aims to answer that question, plus: How can we get ready to do this work in a meaningful way? How can we change how we've been working in order to be anti-racist? What tools do we need? Is what we are trying working? US anti-racism expert, Dr. Camara Jones, has given public health organizations three tasks to end the epidemic of racism: 1) Name racism; 2) Ask, how is it operating here? and 3) Organize and strategize to act. Three provincial organizations -- BC Office of the Provincial Health Officer, BC Centre for Disease Control and Provincial Health Services Authority -- will work together, with guidance from Indigenous peoples, to build knowledge of how to change the population and public health system to uphold Indigenous rights and work in an anti-racist way.</p>
<p>Sharon Karsten</p>	<p>Vancouver Island University</p>	<p>Co-developing a learning health system with people with lived/living experience of substance use: a response to the toxic drug poisoning crisis</p>	<p>Walk With Me was developed by Dr. Sharon Karsten and her research team throughout the past four years with intent to combat stigma and create systems change in relation to the toxic drug poisoning crisis -- a public health emergency that has enacted more deaths in BC than suicides, car accidents and homicides combined. This team has been working in Vancouver Island communities of various sizes, and within Island Health acute care facilities, to better understand the ways in which the drug poisoning crisis is impacting communities and systems. Through deep listening, peer engagement and leadership, and collaborative design, the team has developed recommendations designed to close service gaps and reduce stigma. In the summer of 2022, Island Health released its first Harm Reduction Policy. Stemming from this release is an opportunity to deepen this existing partnership, through the co-creation of a Harm Reduction Learning Health System. This system, developed through patient/peer insights and leadership, and alongside clinicians, management and staff, will enable Island Health to respond effectively to a rapidly-evolving public health crisis.</p>
<p>Elizabeth Keys</p>	<p>University of British Columbia – Okanagan Campus</p>	<p>The SLeep solUtions to proMote Better Early childhood Relationships (SLUMBER) Program: helping families optimize infant mental health by supporting sleep health in early childhood</p>	<p>Most parents struggle with their baby's sleep in the first year. Severe and persistent sleep difficulties can harm parent-child relationships and infant and parental mental health. Parental education, individual consultations, and/or group sessions can help parents improve their baby's sleep but parents are often overwhelmed with rigid or conflicting advice. Canadian families are diverse, and what works for one may not work for others. For example, a family may be impacted by depression, poverty or both, and these intersecting factors will affect what educational content and delivery will work best. The SLeep solUtions to proMote Better Early childhood Relationships (SLUMBER) program will give families options to meet their specific needs to get everyone sleeping better. Each part of the program will be designed in partnership with parents. We will develop groups of program options (portfolios) and test them to see who, how, and why they help. This personalized approach will prevent and/or lessen sleep problems with the added benefit of supporting parent-infant relationships and infant mental health. Having a baby is stressful, and this research will support sleep as a foundational pillar of family mental health and well-being.</p>

Calvin Kuo	University of British Columbia	Errors, uncertainties, and ambiguities in wearable health monitoring systems	<p>Healthcare and diagnostics have recently undergone a paradigm shift with a greater focus on remote health monitoring through wearable technologies. Advances in miniaturized electronics, wireless communications, and big data analytics are all converging in this space to take health monitoring out of the clinic and into the home. However, while the exponential increase in wearable technologies is driving excitement in this field, such technologies have found limited success in clinical integration. While consumers might find a plethora of smart gadgets from watches to rings that can track activity and heart rate, little of this information is getting utilized by clinicians. This is in part due to the lack of transparency and perceived inaccuracy of wearable monitoring systems. We will address this limitation by characterizing errors in measured real-world health signals, accounting for errors in user-device interactions, and capturing uncertainties and ambiguities in decisions that will allow wearable sensors and underlying machine learning algorithms to provide more contextual and nuanced information for clinicians. This will help clinicians decide when and how to apply wearable data to clinical decisions.</p>
Jessica Lougheed	University of British Columbia	Supporting mental health in adolescents and their parents: using developmental science to refine and promote the uptake of a local community intervention	<p>Stressors encountered in daily life such as family conflicts contribute to the risk of experiencing mental health issues such as anxiety. Conflicts between parents and their children increase in adolescence, but research has focused primarily on its mental health implications for adolescents and not also parents. Parents of adolescents go through their own developmental transitions (e.g. midlife) that bring significant stressors with them. Therefore, both parental and adolescent developmental status and mental health need to be understood to help families develop healthy communication and conflict skills, which may benefit the mental health of both individuals. We need to identify which types of emotion patterns are associated with increased risks, or protection from, the development of mental health issues in response to stressors. We aim to identify parent-adolescent emotion dynamics in the context of stress that are associated with both parents' and adolescents' anxiety. The primary impact will be to refine an existing community-based intervention for parents of anxious adolescents and to promote its accessibility by involving families and counsellors in the redevelopment process.</p>
Manu Madhav	University of British Columbia Djavad Mowafaghian Centre for Brain Health Partner: Canadians for Leading Edge Alzheimer Research (CLEAR) Foundation	Quantifying navigational impairments in preclinical Alzheimer's disease	<p>Our brain contains a "cognitive map" of the external world that helps us navigate, and encode/retrieve memories. Dementias such as Alzheimer's Disease (AD) degenerate these regions, causing well-known memory impairments and much less well-understood navigational impairments. My research program seeks to quantify how navigation is impacted in early AD in rodents and humans. Young and older human participants will navigate a virtual reality maze. We will quantify how their errors in positioning and navigating scale when the complexity of the task is increased. We will perform similar experiments in rats navigating a physical maze, where we can additionally record neural activity. We will then extend the task to participants diagnosed with preclinical AD, and rodent models of AD. We will characterize the behavioural and neural correlates of early progression of AD, with the goal of finding a metric that is predictive of AD-induced cognitive impairment, and its underlying neural mechanisms. Over 60,000 British Columbians currently live with dementia. A non-invasive and affordable test such as this will allow clinicians to perform early diagnosis, and start approaches that reduce symptoms and improve quality of life.</p>

<p>Johanna Sam</p>	<p>University of British Columbia</p>	<p>Nini nanaghintsan ?anh (is your mind tired?): the healing journeys of Indigenous adolescents navigating pathways to urban and online wellness supports</p>	<p>Due to the historical and ongoing effects of colonization, Indigenous youth experience higher rates of mental illness. As Indigenous youth, it is particularly difficult to access mental health care in Canada. Many Indigenous youth are reluctant to seek help when they are in crisis. Indigenous youth and families advocate it would be better if more culturally-responsive wellness supports were available. This research project will use oral traditions and storytelling to ask Indigenous youth (aged 12 to 24) about their healing journeys when accessing wellness supports in urban and online spaces. This project will work in partnership with Foundry BC to collaborate with local Indigenous communities. In Phase 1, Indigenous youth will join sharing circles to create collective stories about what holistic wellbeing means to them and how they access wellness supports in community and online settings. In Phase 2, Indigenous youth will be asked to complete a survey about their mental health care access, cultural identity, technology use, and holistic wellbeing. The findings from this study can inform culturally-resurgent practices to help transform the way Indigenous youth are engaged in wellness supports across urban and online spaces.</p>
<p>Julia Schmidt</p>	<p>University of British Columbia GF Strong Rehabilitation Centre Partners: Vancouver Coastal Health Research Institute, VGH & UBC Hospital Foundation</p>	<p>Transforming health services following traumatic brain injury through peer-support</p>	<p>Traumatic brain injury affects approximately 450 people every day in Canada and is a leading cause of disability nationally and globally. These injuries can lead to life-long disability and health problems, and people who sustain them often experience decreased quality of life, poor mental health, and long-term unemployment. There is a critical gap in the development and delivery of programs and services that help people with traumatic brain injury to improve their health. Current health services focus on areas of impairment rather than personally-important priorities for rehabilitation. In addition, participatory research, which engages people with traumatic brain injury and community organizations as active partners, is underused in the development of rehabilitation programs. My goal is to implement a peer support program for people with traumatic brain injury. I will use a partnered approach, in which people with traumatic brain injury and members of their community are leaders in the project. This will ensure that the research answers to their needs and values. Ultimately, this research will improve the access to services, health, and quality of life of people with traumatic brain injury in Canada.</p>
<p>Neal Shahidi</p>	<p>University of British Columbia St. Paul's Hospital</p>	<p>Organ-sparing minimally-invasive endoscopic resection techniques program: incorporating high-quality endoscopic management into everyday clinical practice</p>	<p>Colon cancer is a leading cause of death, disability and healthcare costs in BC. This emphasizes the importance of removing polyps during colonoscopy, which are pre-cancerous growths in the colon that develop into cancer over time. Large polyps (LPs) are especially important. They are common and are more likely to be cancerous at the time they are removed. A number of techniques have been created to safely remove LPs during colonoscopy, including those which can cure early cancers. These techniques, called minimally-invasive endoscopic resection techniques, stop patients from undergoing unnecessary surgery which can lead to disability and death. However, many patients with LPs are still undergoing unnecessary surgery in BC and worldwide. We propose a research program on LPs with two key goals: 1) identifying the best techniques to safely remove LPs and 2) incorporating these techniques into everyday clinical practice. These goals will be achieved by collaborative research projects with national and international experts within this field including the BC Colon Screening Program. Achieving these goals has the potential to improve the health of patients in BC and reduce healthcare costs.</p>

<p>Laura Struik</p>	<p>University of British Columbia – Okanagan Campus</p>	<p>Innovating health promotion efforts in response to youth tobacco use</p>	<p>Today's tobacco use landscape has shifted since the introduction of e-cigarettes, which have become highly popular amongst youth. Nicotine addiction, subsequent smoking, and increased heart and lung disease risk are some of the major concerns brought forward within the public health community in relation to e-cigarette use, with youth disproportionately at risk for these detrimental impacts. Compounding this new landscape of tobacco use include socio-environmental factors that impact use, including rapid advances in technologies (e.g. new social media platforms; smartphone applications). As a result, the new generation of tobacco users are not the same as previous generations, and efforts to protect young people from exposure to tobacco smoke and e-cigarette vapor must similarly shift to adapt to this new landscape. I am responding to this need through my program of research, whereby responsive, youth-driven evidence is being harnessed to develop youth-friendly tobacco control resources for delivery on their preferred digital platforms. Ultimately, this research will lead to optimal solutions to curb tobacco use and reduce tobacco-related disease, situating BC as a leader in adapting to tobacco use of today.</p>
<p>Simon Wisnovsky</p>	<p>University of British Columbia Partner: Lotte & John Hecht Memorial Foundation</p>	<p>Integrating functional glycomics and genomic screening to reveal new targets for cancer immunotherapy</p>	<p>All of the cells in our body are coated with a dense layer of sugar molecules. Cells in our immune system constantly "taste" these sugars. Some types of sugar taste good to our immune system, signaling that our cells are healthy. Other sugars (like those attached to invading bacteria, viruses or cancer cells) taste bad to our immune cells, triggering them to activate and try to protect us from disease. Sometimes, our own cells can become altered in ways that lead them to produce abnormal types of sugar molecules on their surface. When this happens, it can allow cancer cells to evade detection and destruction by the immune system. Our group applies powerful genomics technologies to better understand how human cells generate these immune-regulatory carbohydrates. This information allows us to predict when cell-surface sugars may become chemically altered and identify specific molecules that can be targeted for manipulating immune activity. The insights generated from our research directly impact the design of new immune-targeted cancer therapies.</p>
<p>Amanda Wurz</p>	<p>University of the Fraser Valley</p>	<p>Moving online: developing physical activity interventions with and for young people diagnosed with cancer</p>	<p>Physical activity is safe and beneficial for children, adolescents and young adults diagnosed with cancer. However, few physical activity programs are available for young people diagnosed with cancer. This is partly because cancer is rare in young people; therefore, it is hard to create programs that can be accessed by everyone. In my research, I create and test physical activity programs that consider the needs of young people diagnosed with cancer. Over the next five years, I will work with children, adolescents and young adults diagnosed with cancer and their parents, cancer support organizations, fitness professionals, healthcare providers, and researchers to create online physical activity programs that are safe and accessible. I will then implement and test these physical activity programs with young people diagnosed with cancer across Canada. My work will lead to new physical activity opportunities with the potential to improve the health of young people diagnosed with cancer across the country.</p>