



icord

annual report 2023-24



THE UNIVERSITY OF BRITISH COLUMBIA

ICORD at a glance

April 1, 2023 to March 31, 2024

PEOPLE

Researchers: 88

Principal Investigators - 38
Investigators - 26
Associate Members - 25
Emeritus - 4

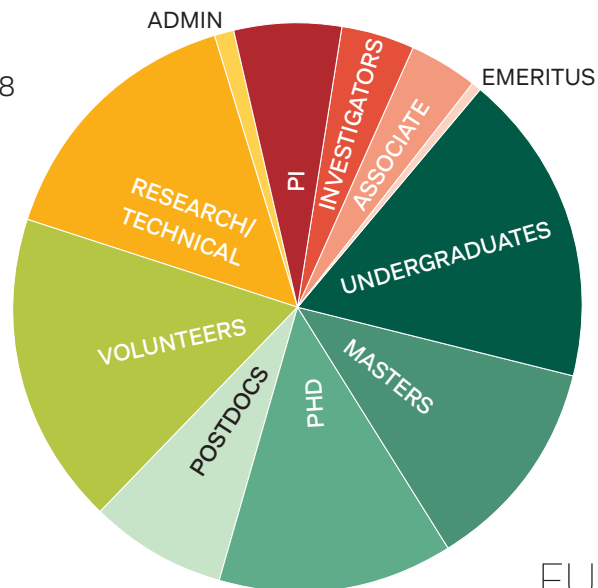
Trainees: 306

Undergrads - 106
Masters - 73
PhD - 80
Postdoc - 47

Volunteers: 106

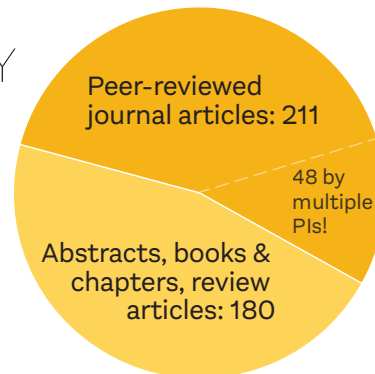
Staff: 97

Research/Technical - 91
Admin - 6



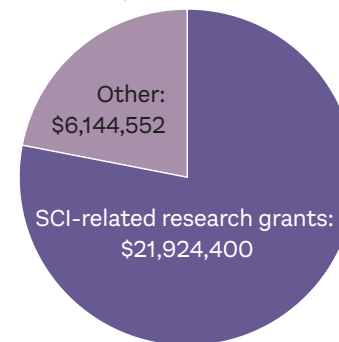
PRODUCTIVITY

Publications by ICORD PIs: 391

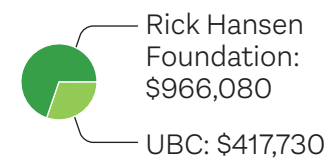


FUNDING

External competitive research grants held by ICORD PIs: \$28,069,000



Support: \$1,383,810



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Introduction

I am delighted to introduce our Annual Report, which covers the activities and accomplishments of our spinal cord injury research centre from April 1, 2023 to March 31, 2024.

I became Director of ICORD in July of this year; the achievements you will read about in this report took place under the guidance and leadership of Dr. John Kramer, who served as ICORD's interim director from July 2023 to June, 2024. I'm sincerely grateful to all of ICORD's past directors: John Steeves, Tom Oxland, Wolfram Tetzlaff, and John Kramer, for building, growing, and supporting this research centre, and for their mentorship and sage advice over the years (and hopefully into the future as well!). I would in particular like to acknowledge and thank Dr. Kramer for stepping in as Interim Director. This was a significant responsibility, and all of us at ICORD owe him much gratitude for providing important leadership and direction since Dr. Tetzlaff stepped down as Director in 2023.

As Director, I am committed to advancing our Centre's position for the benefit of the SCI community. I am excited to work alongside ICORD faculty, staff, and trainees over the next five years to continue moving ICORD forward in our important and far-reaching mission of conducting research and training aimed at developing better strategies for prevention, functional recovery, and enhancing quality of life after SCI.

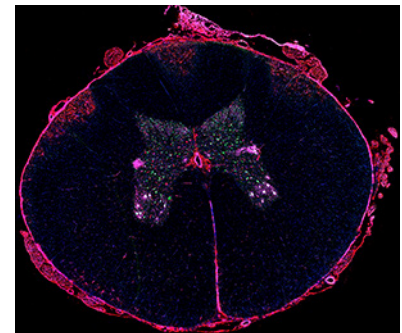
In my ongoing role as a spine surgeon at VGH caring for individuals who have been acutely injured, I continue to see on a daily basis the devastating effect that SCI has on the lives of people and their families. While SCI has been studied in many different ways and so many things about it are investigated and measured, when you see it at the bedside, it is clear that the impact is in so many respects, immeasurable. This continues to be a stark reminder that the work that we are doing here matters.

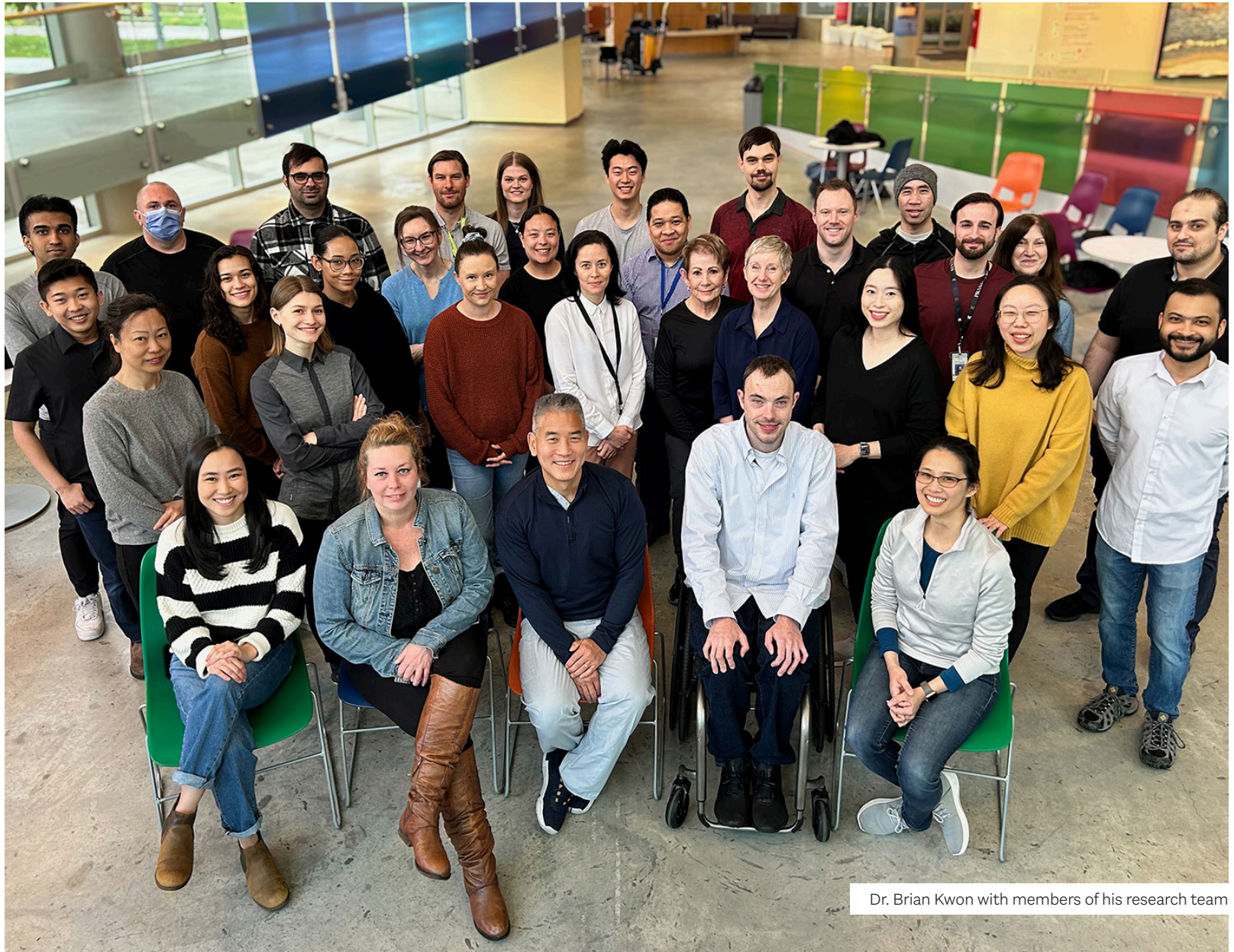
On the following pages you will read about the successes of ICORD's exceptional faculty, staff, and trainees—I am so proud of these ICORDians! You will learn about interesting research studies taking place in our labs, and hear from researchers about their most exciting publications. You will get an update on events and outreach activities that we presented. And you will hear about ICORD programs and shared services supported by the Rick Hansen Foundation. This ongoing support has been vital in creating the vibrant and collaborative atmosphere that helps make ICORD a global leader in SCI research and innovation, for which we are tremendously grateful.



Brian K. Kwon, MD, PhD, FRCSC
Canada Research Chair in Spinal Cord Injury & Dvorak Chair in Spine Trauma
Director, International Collaboration on Repair Discoveries (ICORD)
Professor, Department of Orthopaedics, University of British Columbia

The image on the cover of this report was created by Jing Wang, a technician in my lab. It shows a section of spinal cord tissue stained in three colors: pink highlights cholinergic neurons, which are a type of nerve cell; green shows neurons in the spinal cord; red indicates the presence of a protein called vimentin, which is found in certain supportive cells, and is particularly strong around the central canal of the spinal cord.





Dr. Brian Kwon with members of his research team

2023-24 program highlights

ICORD has a new director

Dr. Brian Kwon has been appointed as ICORD's new Director. A distinguished leader in the field of SCI and spine trauma, Dr. Kwon is recognized globally for his ground breaking research. His cutting-edge innovation in translational research has attracted substantial competitive grant support from esteemed funding agencies worldwide, including a recent \$48 million grant from the US Defense Advanced Research Projects Agency and a \$24 million Transformation Grant from the New Frontiers in Research Fund. His many contributions to the SCI field have earned him numerous accolades, including the inaugural \$1 million Visionary Prize from the Craig H. Neilsen Foundation. In his role as Director, Dr. Kwon will spearhead ICORD's efforts to advance research and training initiatives focused on the development and application of strategies and approaches to improve the lives of those who have suffered a spinal cord injury. His visionary leadership and expertise will empower ICORD to cultivate interdisciplinary collaborations, harness state-of-the-art technologies and deliver significant research breakthroughs.

Heather Gainforth: UBCO's Researcher of the Year for Health Research

Dr. Heather Gainforth was UBC-Okanagan's Researcher of the Year for health research in 2023. This award recognizes the ways in which UBCO researchers are making the world a better place through excellence in research and scholarly activity. Alongside her teaching in the School of Health and Exercise Sciences, Dr. Gainforth's research is focused on helping people with SCI live better lives. She engages directly with people living with SCI and invites the SCI community to help direct her work, in order to focus on the community's high-priority needs that have historically received little research attention.

Brett Hilton: Brain Canada Future Leader in Canadian Brain Research

Dr. Brett Hilton was one of 28 neuroscientists in Canada to be awarded \$100,000 each in research funding, as part of Brain Canada's 2022 Future Leaders in Canadian Brain Research Program. The award, presented in September, 2023, recognizes early-career researchers who are "making substantial contributions to brain research across the country and around the world." Dr. Hilton was also named Michael Smith Health Research BC Scholar. The MSHRBC Scholar program supports early-career health researchers who are building leading-edge health research programs, training the next generation of scientists and expanding their potential to make significant contributions to their field.

"Since 2000, when I started my PhD in the laboratory of Dr. Wolfram Tetzlaff, I've witnessed the passion, dedication, and expertise within the ICORD community, and I have always been inspired by what we strive to achieve at ICORD and what it means to the broader SCI community."

- ICORD Director, Dr. Brian Kwon

Clinical trial started to test spinal cord stimulation to improve bladder function.

SCONE™ (SpineX Inc.) is an innovative experimental device which delivers non-invasive stimulation to the spinal cord. ICORD researchers in the laboratory of Dr. Andrei Krassioukov are currently investigating its effects on improving urinary incontinence, primarily in people with neurogenic lower urinary tract dysfunction (NLUTD), a common neurological condition following SCI, stroke, or multiple sclerosis (MS) which primarily causes urinary incontinence and significantly impacts quality of life. Improvements in bladder and other pelvic organ functions, like bowel and sexual function, are rated as top priorities for recovery among affected individuals. SCONE has been tested in a small-scale trial with three participants living with SCI and is currently being tested more extensively for its efficacy in treating bladder and bowel dysfunctions by several clinical studies worldwide, with Dr. Krassioukov's team conducting the Canadian trial on NLUTD.

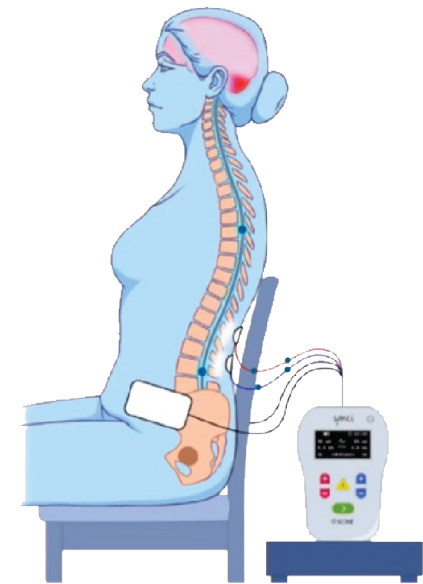
Alison Williams won the 2023 UBC President's Staff Award for Enhancing the UBC Experience

Ali was honoured for her contributions to research, education and community engagement which help create a safe, inclusive and supportive environment at ICORD. Her sincere commitment and enthusiasm to contribute shine through in her interactions with the ICORD community, whether it is orienting new students, strengthening relationships with community stakeholders, or sharing in the responsibility of ensuring high-quality research for publications and grant applications. She mentors and supports students behind the scenes, and skillfully identifies strengths and opportunities for their growth. Ali facilitates effective collaboration and instills a rich sense of confidence and community among researchers, students, community partners and research participants with SCI. Her efforts with the community not only build the foundation for ongoing outreach initiatives, but also benefit community partners who are confident and equipped to work with individuals with diverse bodies.

seed2STEM grew exponentially

seed2STEM is a unique program, started at ICORD in 2018, that offers six-week paid research internships for Indigenous students from Grade 9 to 12 plus wraparound supports such as transit passes, meals, loaner laptops and youth support workers. Program alumni enrolled in post-secondary studies are offered 4-month summer research assistant positions. 60 students took part in the program in 2024 (six undergraduates and 54 high school students). This is a significant increase over 2023 when 19 students participated. The 2024 cohort was split between Vancouver (32 students) and Kelowna (28 students). In addition to working in research labs, students spent one day a week together doing research learning modules, hearing from guest speakers, going on field trips to scientific or cultural places of interest, and doing hands-on learning activities.

seed2STEM is incredibly grateful for support provided by the UBC School of Biomedical Engineering, Vancouver Coastal Health Research Institute, BC Gynecologic Cancer Initiative, the BC Centre for Disease Control, Provincial Health Services Authority, UBC Radiology, UBC Pathology & Laboratory Medicine, Stryker, the UBC Faculty of Medicine Strategic Investment Fund, the UBC Strategic Equity & Anti-Racism Enhancement Fund, the UBC Indigenous Strategic Initiatives fund, and many generous private donors.



SCONE™ study illustration



Alison Williams receives President's Staff Award

"I came from over 1,000 km away and I definitely do not regret it! This is one of my biggest accomplishments. **Being a researcher is my long-term goal.**"

"I liked having access to a lot of **knowledge & resources** in an environment where I wasn't being graded"

"I used to believe that a **job in science was past my abilities**, but this program inspired me to **think about science as a career.**"

"I actually really like chemistry"

2024 post-program student feedback:

100%

felt **accepted and respected** by supervisors, lab mates and staff.

95%

felt **included** in lab activities and **supported** when they had questions and problems.

94%

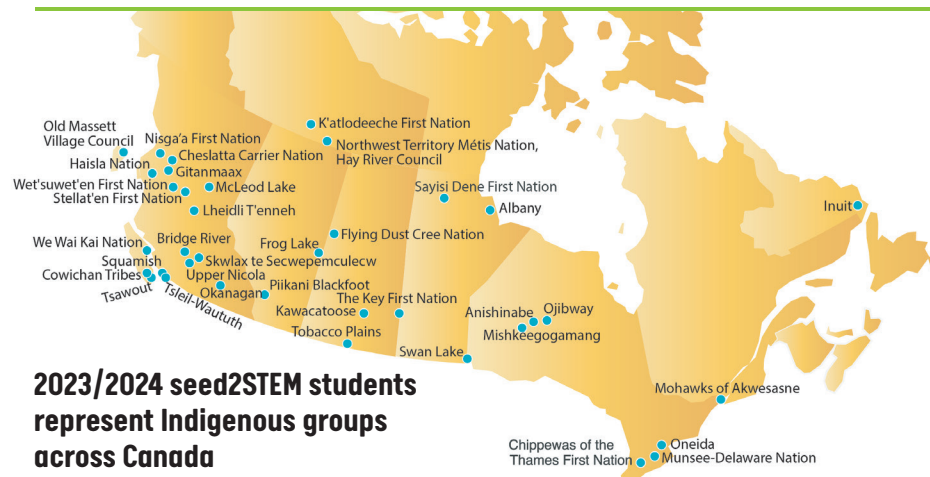
learned **new skills & techniques** that they could use to achieve their individual goals.

95%

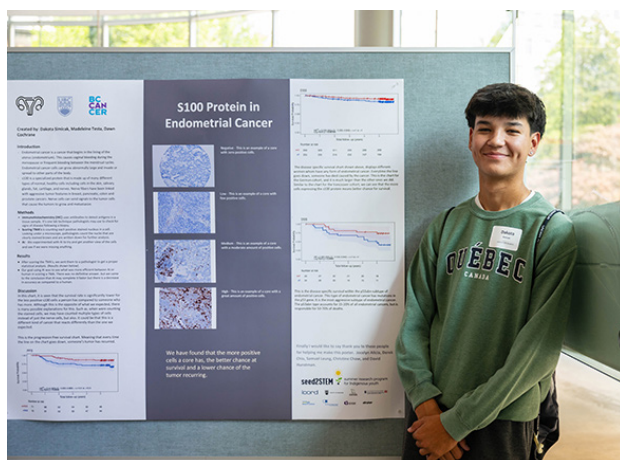
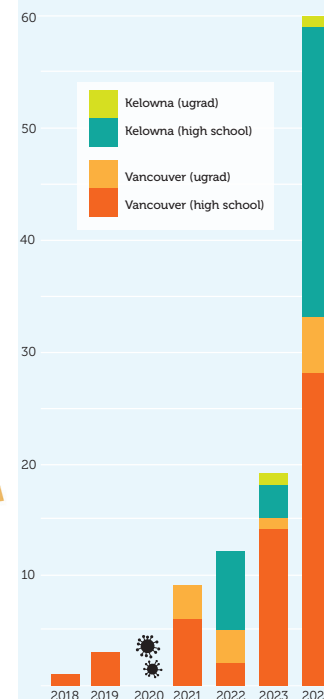
thought seed2STEM was a **good use of their time.**

98%

plan to **return next summer.**



Program growth, 2018-2024



seed2STEM summer 2024: (L-R) seed2STEM poster celebration, August 9; safety training for students at the BC Centre for Disease Control; field trip to STEMCELL Technologies

Research Grants

- Dr. Jaimie Borisoff, Director of MAKE+ and former Canada Research Chair, received \$1,011,000 from the Canada Foundation for Innovation for his project *Advanced Mobility Devices to Expand Wheelchair Capabilities for Increased Community Participation*. As wheelchair designs become more innovative and sophisticated, it is important that the reliability of their safety and performance be evaluated. It is also clear that new capabilities need to be developed to improve the lives of people with disabilities.
- Several ICORD researchers were successful in the Canadian Institutes for Health Research competitions this year, including:
 - Dr. Babak Shadgan for advanced optical monitoring of free tissue transfer hemodynamics. \$670K over 4 years.
 - Dr. Janice Eng for implementation research to improve scale-up of the delivery of evidence-based community exercise programs for stroke. \$100K over 1 year.
- Drs. Shadgan and Kwon received funding from the the US Department of Defense (SCIRP – Translational Research Award) for their project, Advanced physiologic monitoring at the site of spinal cord injury (\$1.7M).

Events & outreach

International Day for Women & Girls in Science

The atrium of the Blusson Spinal Cord Centre was filled with excited and curious future scientists on Friday, February 9 as ICORD hosted a celebration of the UN International Day for Women and Girls in Science. More than 100 guests visited displays and fun interactive demonstrations by ICORD's Tetzlaff and Lam Labs, Vancouver Coastal Health Research Institute, Gynecologic Cancer Initiative, Geering Up, SCWIST, and Human in Motion Robotics.

"This day is an opportunity to promote equal access to and participation in science. As you all know, women and girls play a critical role in science, tech, engineering and mathematics communities and their involvement should be strengthened. We are underrepresented in these careers and that impacts the type of research that takes place," said ICORD Managing Director Dr. Nancy Thorogood in her welcome address. "In Canada, 34% of people who graduate with a STEM degree are women but only 25% of people working in STEM careers are women. I'm glad to say that here at ICORD, 44% of our PIs are female," she added. We hope this event inspired some thoughts about science careers!

SCI BC Health Forum + Research Roadshow

Held on March 14 at the Blusson Spinal Cord Centre, this event, organized by Spinal Cord Injury BC and hosted by ICORD, brought together members of the SCI community to learn about innovative SCI research on pain, electrical stimulation, spasticity and overall healthy living. ICORD's Research Liaison, Adam Doelman, organized a study fair to highlight current ICORD clinical studies recruiting for participants.

Future Science Leaders

Science World's Future Science Leaders (FSL) is an after-school science enrichment program for teens designed to unleash creative potential and build a life-long network of like-minded peers while engaging curious minds with the nature of STEAM (science, technology, engineering, art & design, and math) in sessions led by diverse experts and professionals. The FSL group visited ICORD in the Fall of 2023 for a talk on SCI and ICORD researcher, followed by visits to research labs in the Blusson Spinal Cord Centre. Feedback from the students and group leaders was very positive.



Celebration of Women and Girls in Science, February 9, 2024



Spinal Cord Injury BC Health Forum and Research Roadshow, March 14, 2024

ICORD Trainee Symposium

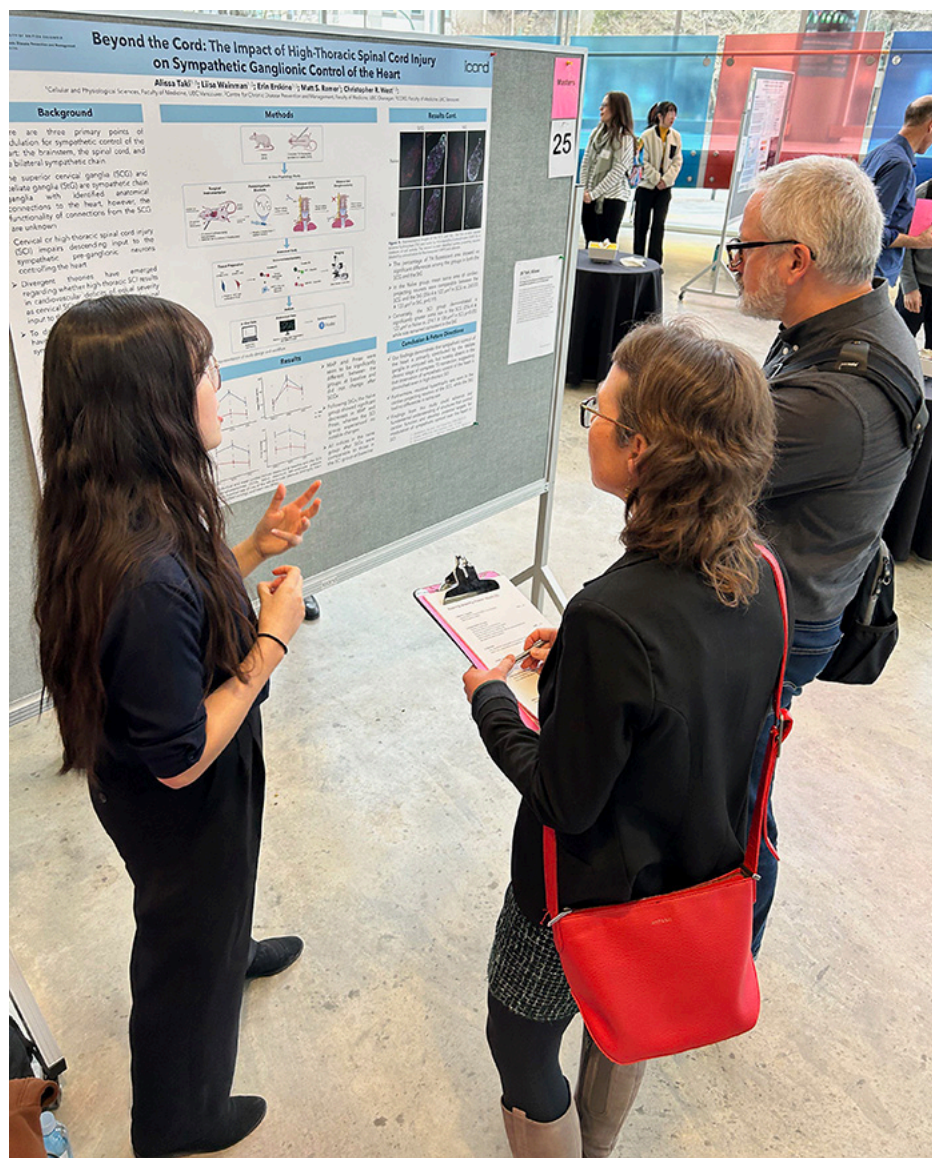
On October 19, 2023, ICORD Trainees hosted their annual symposium with a focus on the practice of knowledge sharing. The event, with more than 75 registered participants, incorporated plain language summaries and judges with lived experience of SCI. The event featured trainee seminars, an ICORD faculty talk, keynote seminars by Dr. Chet Moritz visiting from the University of Washington and Jim Ryan, an ambassador for the Rick Hansen Foundation. Attendees enjoyed a lively poster session with 35 trainee posters.



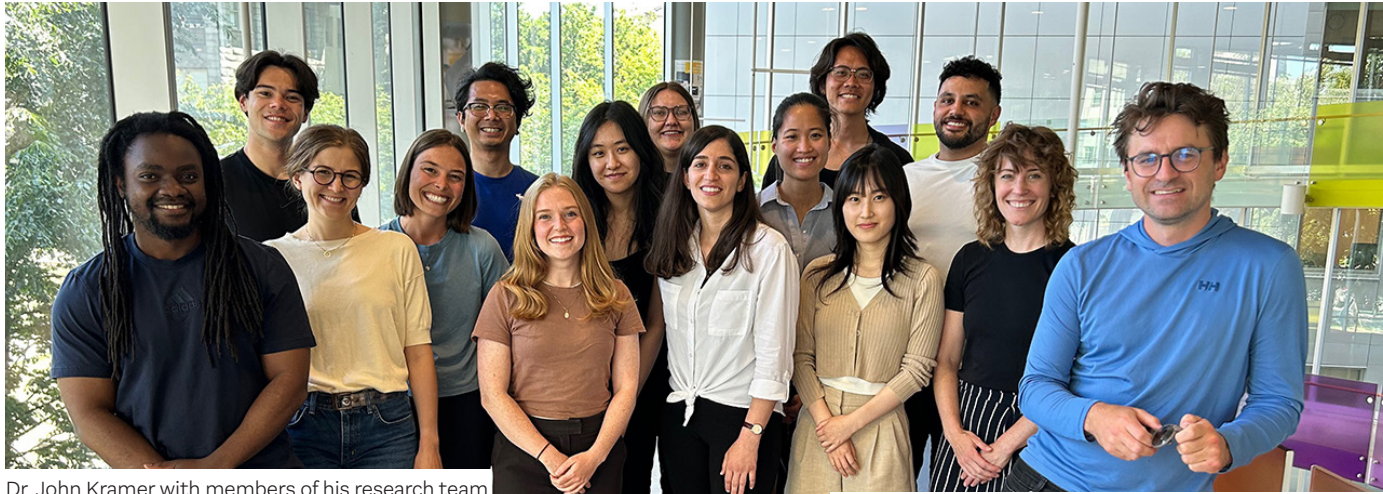
Annual Research Meeting

ICORD hosted its 21st Annual Research Meeting (ARM) on March 6-7, with 166 people in attendance over two days. Keynote talks were given by Dr. Veronica Tom from Drexel University in Philadelphia and Dr. Volodymyr Golyk from the World Health Organization (WHO) Country Office in the Ukraine. ICORD researchers Drs. Babak Shadgan, Shannon Kolind, Ryan Hoiland, Peter Cripton, Chris West and Lyndia Wu presented short research talks. ICORD Postdocs, Drs. Paulina Scheuren, Bethany Klondiles, and Timo Friedman gave the Emerging Researcher talks. A longtime ICORD supporter and collaborator, Dr. Fabio Rossi, gave a special presentation on his lived experience of spinal cord injury and his research on a potential molecular target for therapy. Trainees and staff presented 60 research posters.

In a message to participants included in the meeting program, Rick Hansen said, "Events such as this year's Annual Research Meeting enable the international collaboration needed to advance innovative research and help set the bar higher towards world-class SCI care and cure. It's an opportunity to reflect on how far we've come and how far we still need to go towards finding a cure for paralysis – one of the big dreams of the Man In Motion World Tour. Thanks to you, we are making strides every day towards this goal."



Judges Dr. Chris McBride (right) and Dr. Femke Hoekstra (centre) meet with a poster presenter at the 2024 Annual Research Meeting.



Dr. John Kramer with members of his research team



Dr. Jasmin Ma with members of her research team



Dr. Tania Lam with members of her research team

Clinical studies

Between April 2023 and March 2024, ICORD researchers initiated recruitment for 15 new human-based research studies, ranging from surveys to exercise interventions. Recruitment assistance is supported by the Rick Hansen Foundation through Spinal Cord Injury BC's recruitment coordinator (see page 14).

Neuromodulation for bladder function (SCONE clinical study): Researchers in Dr. Andrei Krassioukov's lab are trying to understand how neurogenic lower urinary tract dysfunction (loss of bladder control) can be recovered after brain or spinal cord damage due to spinal cord injury, multiple sclerosis or stroke. The spinal stimulation study device (SCONE™) is investigational; while Health Canada has not approved the use of the SCONE device to treat bladder dysfunction, it has approved its use in this clinical study. See page 6 for more information about this clinical trial.

Pelvic floor muscle activity during exoskeleton walking: Researchers in Dr. Tania Lam's laboratory are investigating how the pelvic floor muscles respond to walking in different exoskeletons. Special recording electrodes are used on participants to monitor activity from the pelvic floor, trunk, hip, and leg muscles during walking in the Lokomat and Ekso at different speeds.

eHealth program to support family caregivers of individuals with SCI: Researchers in Dr. William Miller's lab have a multi-phase eHealth module development study underway. After completing the first stage of co-creating the contents of the module from family caregivers and healthcare professionals through numerous interviews they have identified nine main topics that may be included in the online module and are prioritizing the main topics and the sub-topics from all the contributions through an online survey.

Experiences of people with SCI leaving rehabilitation and integrating into the community: Researchers in Dr. Ben Mortenson's lab are working to understand the perspectives and the challenges of patients with SCI regarding returning home after being discharged from rehabilitation facilities and identify solutions to facilitate the transition of patients with SCI back to the community through a brief survey on post-discharge needs and quality of life. Other clinical studies underway in Dr. Mortenson's lab include:

Physiological impact of the AAPLEwalk sit to stand exercise machine: This study aims to explore the usability and acute physiological potential of a new sit to stand exercise machine that is being developed by Dr. Jaimie Borisoff and his colleagues at BCIT.

Integrating patient-centered outcomes in rehabilitation and community spinal cord injury care: Patient-centred spinal cord injury care considers the needs, preferences, and values of patients. This study from the Mortenson Lab looks at using self-assessment questionnaires at specific time points in treatment to help clinical teams better understand how individuals with SCI feel and can function, and plan the next steps in treatment.

Evaluation of occupational engagement while using an activity chair: this completed capstone project by UBC Masters of Occupational Therapy students under the supervision of Dr. Ben Mortenson and William Miller aimed to understand how the use of an activity chair affects daily living among adults with chronic conditions resulting in pain, fatigue, or low standing endurance.

Push until it hurts: The impact of acute exercise on muscle-level pressure pain: Researchers in Dr. John Kramer's lab are investigating how exercise impacts pain experience. The study involves pressure pain measurements before and after a bout of high-intensity cycling.

Sleep routines and sleep disturbances after SCI: Dr. Victoria Claydon and her research team at SFU, and community partner Spinal Cord Injury BC are investigating the sleep routines, disturbances, and barriers to sleep supports experienced by individuals with SCI, as well as the impacts of these sleep problems on daily life. Their survey study aims to characterize the milieu of routine and physiological sleep disturbances after SCI.

Recreational adaptive devices (RAD) study: Drs. Miller and Mortenson partnered with RAD Society with the aim of designing outdoor programs to encourage outdoor recreational activity for individuals with mobility impairments. The purpose of this study, which is now completed, was to understand the needs, interests, and challenges of individuals with mobility impairment regarding outdoor recreational activity and the development of a recreational adaptive device loan program.

Recognition of high-level visual form: Researchers in Dr. Ipec Oruc's lab are investigating how human observers recognize complex visual patterns and objects such as letters and faces, and how visual recognition is normally accomplished in healthy human observers.

Cycling infrastructure project community survey: Researchers in Dr. Mortenson's lab studied transportation and cycle lane experiences of cyclists or wheeled mobility device users (e.g. users of manual or power wheelchairs, and wheeled mobility scooters). Cycling is gaining prominence as a sustainable method of transportation, yet wheeled mobility devices are not often imagined as part of the cycling network. This completed study aimed to learn more about how users with disabilities navigate pathways with different devices, and how to improve cycling infrastructure for a variety of users including those with mobility devices.

Priorities for recovery following SCI: Researchers in Dr. Andrei Krassioukov's lab invited individuals living with SCI, healthcare professionals/clinicians, and researchers/scientists to complete a survey about the SCI community's priorities for recovery, as well as to assess the understanding of recently developed technologies – in particular, spinal cord stimulation as a rehabilitation strategy. The survey has been released internationally to 18 countries to allow for cross-country comparisons and includes comparisons between the opinions of individuals with lived experience, researchers, and clinicians.

Relationship between spasticity in walking and hyperactive spinal reflexes: Researchers in Dr. Lam's lab are studying the day-to-day differences in muscle reflexes and the relationship between muscle reflexes and movement in people with and without spinal cord injury. Data collected from this study will improve understanding of the relationship between altered reflexes and problems in movements after spinal cord injury. It will also help researchers design better ways to measure spasticity.

Validating quantitative ultrasound measures of upper limb muscle size: Muscle strength, especially in the upper limb, is a very important outcome related to physical functioning and quality of life. However, current strength testing devices (dynamometers) are unable to capture the strength of a single muscle and often focus on the lower rather than the upper limb. A measurement that is closely related to muscle strength is muscle size. One method that has been reliably used to measure the size of muscles is ultrasound (US), which is an accessible and non-invasive device. However, there is still a lack of research on the use of US measurements of muscle size as it relates to muscle strength in individual muscles of the upper limb. Researchers in Dr. Mike Berger's lab want to understand the association between US measures of muscle size and measures of the same muscles using a strength testing device, to add to current methods and be useful for assessing physical functioning in medical settings. They are finding the association between US measures and strength testing device measures. The study will focus on muscles of the upper limb including the biceps brachii, brachialis, triceps brachii, flexor pollicis longus, and first dorsal interosseus.



Dr. Mike Berger and members of his research team work with a research participant in a clinical study

Rick Hansen Foundation supports capacity-building



The incredibly generous support provided to ICORD by the Rick Hansen Foundation (RHF) is crucial. Not only does the funding directly support many key ICORD programs, but the broader impacts are significant as well. With shared technology, equipment, seed grants, travel awards for trainees, seminars, and international exchange programs, ICORD attracts bright researchers and trainees focused on SCI research. We are excited to build on this strong foundation to advance our mutual goals with RHF in the future. We are sincerely grateful for the continued support of the Foundation for the following programs:

Seed Grants

Seed Grants funded by the Rick Hansen Foundation since 2014 leveraged more than \$34M in competitively-funded research grants by the end of the 2024 fiscal year. Through the seed grant program, there have been 100 seed grants with \$1.87M in BICP support. The amount leveraged will continue to grow with the new seed grants awarded this fiscal, in addition to past grants that remain active.

This year, two seed grants were instrumental in the success of the following grant applications:

\$20K -> \$1.18M (\$140K ISRT previous leveraged grant + \$240K Craig H. Neilsen Foundation grant + \$800K CIHR grant)

Dr. Chris West has received three grants using results from a 2018 seed grant titled, Effect of acute intermittent hypoxia on cardiovascular function in a rodent model of spinal cord injury.

\$11.6K -> \$25K (Community-University Engagement Support Fund)

Dr. Andrea Bundon received a grant that utilized collaborative data from Dr. Bonnie Sawatsky's 2021 seed grant titled, Does exercise at home or a gym offer better outcomes for people with SCI: a feasibility study?

Central Participant Recruitment

When it comes to SCI research, a rate-limiting step has been the timely recruitment of participants with SCI. To overcome this, the partnership between ICORD and SCI BC was solidified to build interest by people with SCI to participate in ICORD research through knowledge translation (KT) activities and to recruit study participant through SCI BC's connections with their members. With support from RHF, the partnership continues to have a positive impact on meeting research demand for participation.

With recruitment for participation by people with SCI presenting a persistent post-pandemic challenge across the country (and beyond), the value of this partnership continues to show its worth by dedicating human resources to multimodal recruitment efforts and being able to prioritize these efforts on ICORD-related studies and KT activities. SCI BC is uniquely positioned to partner with ICORD to promote participation in their research and to support knowledge translation related to their research activities. With an active membership of over 2,900 people throughout the province, a Spin magazine readership of an estimated 16,000, >300,000 annual visits to our websites, and a very engaged social media community, SCI BC has the power to connect with the target population for ICORD researchers.

Over the past several years, the expanding ICORD research excellence and capacity at UBC Okanagan has broadened the opportunity for people with SCI to participate directly in SCI research to other regions of the province. We also continue to engage with researchers at UNBC, thus expanding the potential for future ICORD collaborations.



Highlights of the ICORD-SCI BC partnership for 2023/2024:

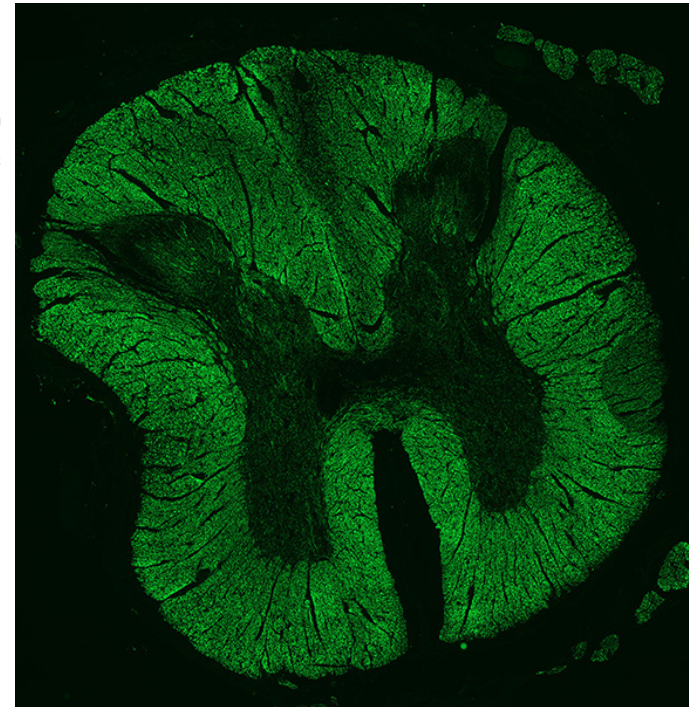
- More than 12 SCI BC staff members and managers contributed directly to the purposes of the partnership The Spin magazine – four issues, 4,000 copies per issue with an estimated readership of 16,000 per issue.
- Recruitment – eight ads featuring seven ICORD studies featured in Participate in Research section
- Knowledge translation – ICORD Researchers and Opportunities featured in 8 stories
- SCI BC Monthly peer newsletter to 1,897 people included 73 “Participate in Research” promos and links to stories about ICORD research
- SCI BC Facebook page with 4,501 members had 32 study recruitment/KT-related posts
- Instagram with 2,054 followers had 21 study recruitment/ KT-related posts
- SCI BC YouTube channel with 1,481 members added one accessible home workout KT session with Dr. Jasmin Ma (226 views)
- Two SCI BC blog posts featuring ICORD research
- Hosted ICORD Research Roadshows featuring ICORD studies and researchers. Over 175 people with SCI attended these events in Prince George, Kelowna, Surrey, Victoria, and Vancouver.
- 6 academic outputs by ICORD researchers involving SCI BC’s direct participation as a co-application, community partner, and/or knowledge using.
- Direct recruitment through targeted emails and phone calls

International SCI Biobank

The International SCI Biobank (ISCIB) is a translational research resource consisting of a collection of biospecimens, images and data to support biomedical research and to ultimately improve patient outcomes following SCI. ISCIB is an international, “poly-user” biobank, meaning that all biospecimens and their associated information are made available to researchers globally. ISCIB has curated biospecimens and associated data from three distinct acute and chronic SCI participant consent categories: alive, alive and participating in another research study, and deceased. From the “alive” categories, cerebrospinal fluid, plasma, serum, and PAXgene Blood RNA tubes are collected, while cerebrospinal fluid and spinal cord tissue are collected from the “deceased” category.

2023-24 highlights include:

- Acquisition of spinal cord tissue: ISCIB currently stores twenty spinal cords from deceased donors with SCI, three of which were collected between April 1, 2022 and March 31, 2023.
- Fluid biospecimens collection: As of March 31, 2024, ISCIB held 29,003 aliquots of cerebrospinal fluid, 27,538 aliquots of serum, 11,523 aliquots of plasma, and 3,832 PAXgene Blood RNA tubes from a total of 308 participants. These include individuals diagnosed with acute, sub-acute or chronic SCI, with injury classifications from AIS A through AIS D, as well as uninjured AIS E control participants.
- Imaging and histologic staining: Radiological and histological processes have been developed and facilitated through a collaboration with Drs. Kozlowski, Laule, Moore and Hirsch-Reinshagen. To date, 1,784 ISCIB blocks have been paraffin-embedded and



A section of human spinal cord tissue stained with an antibody against myelin basic protein (MBP; SMI-99). This antibody is used to visualize changes in myelin after a spinal cord injury.

are available for tissue requests.

- Over 2,500 histological images are available, including images from published ISCIB requests.
- International requests and acknowledgements: As of March 31, 2024, ISCIB has initiated 42 requests worldwide, and has approved 31. Eight requests were received in the past year. These requests originated from both academic and commercial institutions across ten countries. ISCIB has been acknowledged in three independent, third-party papers in peer-reviewed journals (Global Spine Journal, Nature Communications, Brain Communications), and has over 40 acknowledgements in various academic oral and poster presentations.

SCIRE

SCIRE (Spinal Cord Injury Research Evidence) is a free online resource that covers a comprehensive set of topics relevant to SCI rehabilitation and community reintegration. SCIRE reviews, evaluates, and translates existing research knowledge into a clear and concise format to inform health professionals (SCIRE Professional) and people with SCI and their families (SCIRE Community) of best rehabilitation practices following SCI. This past year was the fourth year that funding from RHF directly supported this integral part of the infrastructure of SCI information worldwide.



SCIRE Professional Highlights include:

- The first Clinical Practice Guidelines page in the world that features all available CPGs in SCI.
- 54 videos demonstrating treatments and highlighting important stories of people with SCI (643,000+ views).
- Over 130 Outcome Measures that are commonly used to measure people with SCI and their progress in rehabilitation.
- With SCIRE as the methodology team, the Canadian SCI Practice Guidelines (CAN-SCIP) were created - the first living comprehensive guidelines providing recommendations in all areas of SCI care. It includes the CAN-SCIP Coach App where clinicians from around the world can enter SCI patient-specifics to receive tailored treatment recommendations.
- A special section on Primary Care and SCI with concise treatment recommendations and resources for family doctors was created in 2023. The section includes easy downloadable resources for both doctors and their patients with SCI.

SCIRE Community continued to add useful content to their website for people with SCI and their families, including:



- updated articles on SCI Basics, Understanding Research Evidence, and Exercise Guidelines
- translations of eight articles into French, and 15 into Greek
- addition of new articles on nerve transfer surgery, adapted sports & equipment, breastfeeding following sci, pregnancy after sci, shoulder injury and pain
- addition of new website section called *Community Stories*

Yuel Family Physical Activity Research Centre

The Yuel Family Physical Activity Research Centre (PARC) is ICORD's flagship engagement initiative within the Blusson Spinal Cord Centre. Located on the first floor of the Blusson Spinal Cord Centre, the purpose of PARC is to provide community members with SCI and related impairments with a space where they can be physically active and meet their exercise goals. Compared to similar amenities at other universities and/or health care facilities, PARC is unique in that community members are not required to register for a set program but are instead encouraged and supported to attend on a drop-in basis. The focus is on supporting participants to experience autonomy and choice regarding the frequency and type of exercise they engage in, while still providing the support they need. The facility houses a complete system of HUR resistance exercise machines that use smart card technology to 'remember'



participants, and automatically adjusts the resistance on the machine using air compressors. Cardio machines in the facility are modified for greater accessibility and many allow participants the option of exercising without transferring from their day chairs, enhancing the safety and feasibility of exercise participation for numerous individuals. The community celebrated the 10th anniversary of PARC with an event held in September 2023, with approximately 150-200 guests in attendance, including staff, past and present volunteers, and PARC participants.

Notable initiatives from 2023-2024 include:

Group exercise classes: Many members indicated that the online classes introduced during the pandemic helped them feel connected to the community when they could not attend in person. The online classes have also been successful in engaging new participants and/or reconnecting past participants who had moved out of the area. PARC continues to offer four online classes each week and, this year, we implemented a 6-week online class challenge with a prize to promote attendance. We also developed two new in-person classes to bring members together for group exercise and facilitate social connectedness in the facility. 'Stretch & Relax' focuses on breathwork, stretching, and mobility to relieve muscle tension and boost relaxation. 'Power Circuit' is a boxing-inspired, circuit-style workout that aims to improve both muscular strength and cardiovascular fitness. We continue to offer adaptive spin classes in person and online, as well as wheelchair table tennis twice a week.

Work Integrated Learning: For the second year, UBC's School of Kinesiology has offered a 'Work Integrated Learning' (WIL) course at PARC. This course provides students with the opportunity to develop applied skills and competencies in community and workplace settings while earning credits towards their degree. Overseen by Dr. Jasmin Ma, 10 students enrolled in the second PARC WIL course. This has allowed us to offer participants individualized exercise prescription, physical activity counseling, and technique coaching.

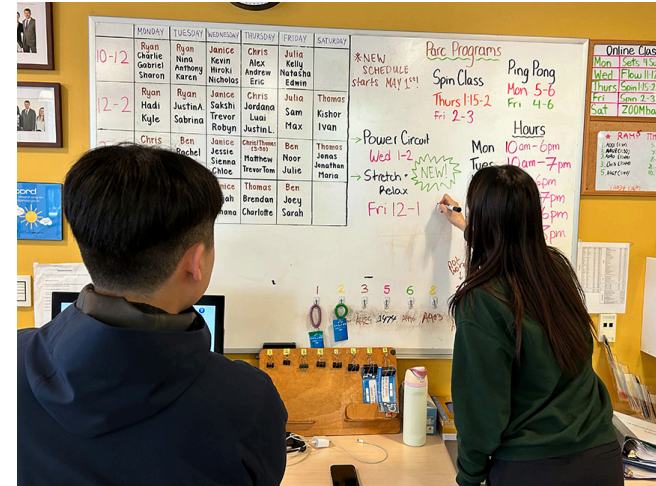
Shared Resources

Equipment

Funding from RHF supports shared scientific research equipment that is made available to all BSCC researchers, trainees, and staff. Combined, there is approximately \$14 to \$16M in research equipment at ICORD. RHF funding for service contracts to maintain and repair equipment is critical to maintain key, shared, state-of-the-art equipment and infrastructure. Examples of equipment directly supported by RHF include: electron microscope, confocal microscopes, two photon microscopes, light-sheet microscope, slide scanner, autoclaves, biosafety cabinets, water distillers, cryostats, icemakers, ultralow freezers, PARC gym equipment, metabolic carts, isoflurane vaporizers and cage washers. The shared equipment provides a cost-effective resource for users who may not otherwise have access to such equipment for their research.

Research Support

The provision of vital support to maintain sensitive equipment and develop and teach research techniques to researchers enables researchers to learn new techniques quickly and rapidly increase their productivity. ICORD's full-time Facilities Manager, Yuan Jiang, is partially supported by RHF. Yuan is a vital resource who oversees equipment repair and maintenance. He also provides instruction and training to new researchers, as well as co-chairing our local safety committee and supporting safety initiatives. Also supported by RHF funding, ICORD's Senior Administrative Assistant, Katie Ashwell, and Finance Coordinator, Chandelle Coleman, support all investigators, trainees and research participants at ICORD and contribute to the ICORD community at the Blusson Spinal Cord Centre by allowing faculty and trainees to focus on their research goals.



PARC activities throughout the year. Clockwise from top left: stretch class; student supervisors at work; collage of photos from the 10th anniversary party; student supervisor at work.

Publication highlights

Papers from the past year that ICORD researchers are most excited about:

Mike Berger

Debenham MIB, Franz CK, Berger MJ. Neuromuscular consequences of spinal cord injury: New mechanistic insights and clinical considerations. Muscle Nerve. 2024 Mar 13. doi: 10.1002/mus.28070. Epub ahead of print. PMID: 38477416.

This is the most comprehensive review of how SCI affects nerves and muscle below the level of injury.

Andrea Bundon

Antunovic D, Bundon A, Lerhfeld L, Gancayco P. "New heights" in storytelling? Considerations for cross-national analysis of broadcasters' social media coverage of the Paralympics. Communication and Sport. <https://doi.org/10.1177/21674795241238>

There has been a lot of talk in recent years about the 'progress' of the Paralympic Movement often centered around the increased media coverage of the Paralympic Games and increased visibility of Paralympic athletes in the media. Specifically, rights-holding broadcasters (such as CBC in Canada and NBC in the US) make a lot of flashy announcements about how they are going to be producing and airing more coverage of disability sport than ever before. In this study, we looked at what CBC and NBC actually delivered in terms of Paralympic coverage for the Beijing 2022 Paralympics and specifically how they used social media. Our findings including that there was a lot of talk about bringing the Paralympics to new audiences and providing better coverage of disabled athletes but what was delivered was underwhelming. Yes, the broadcasters are talking more about the Paralympics but most of what they put out on social media directed viewers to the same old coverage – generally short 'recaps' of the sport events rather than live coverage. Additionally, we considered some 'best practices' for sports journalism (such as ensuring gender balanced coverage, telling diverse stories, portraying individuals with different types of impairments) and found that it was really hard to evaluate the broadcasters in these areas because they were producing so little. Producing better coverage of the Games needs to start with increasing the amount of coverage and not just using Twitter(X) to announce the same coverage over and over.

Jacquelyn Cragg

Crispo JAG, Kuramoto LK, Cragg JJ. Global burden of spinal cord injury: future directions. Lancet Neurol. 2023 Nov;22(11):976-978. doi: 10.1016/S1474-4422(23)00366-6. PMID: 37863598

This is a commentary on a published study regarding the global burden of spinal cord injury, published in the Lancet Neurology.

Peter Crompton

Forman J, Booth G, Mergler O, Romani S, Zhan H, Roberts C, Siegmund GP, Pipkorn B, Crompton PA. Variability in Body Shape, Superficial Soft Tissue Geometry, and Seatbelt Fit Relative to the Pelvis in Automotive Postures-Methods for Volunteer Data Collection With Open Magnetic Resonance Imaging. Journal of Biomechanical Engineering. 2024;doi: 10.1115/1.4064477.

We can visualize the spine posture and seat belt routing in a variety of automotive seating configurations in a group of male and female human subjects. We can use this to better understand sex-differences in spinal column and spinal cord injury in motor vehicle collisions.

Janice Eng

Peters S, Lim SB, Bayley MT, Best K, Connell LA, Corriveau H, Donkers SJ, Dukelow SP, Klassen TD, Milot MH, Sakakibara BM, Sheehy L, Wong H, Yao J, Eng JJ. Implementation of increased physical therapy intensity for improving walking after stroke: Walk 'n watch protocol for a multisite stepped-wedge cluster-randomized controlled trial. Int J Stroke. 2023;18:117-122.

This publication is not with SCI, but it is a unique 12-site Randomized Clinical Trial (RCT) from Nanaimo to PEI to change usual care clinical practice in



real-world stroke rehabilitation settings. The design called “Stepped wedge cluster RCT” is a cutting-edge new research design appropriate for implementation research. This is the protocol paper and it took enormous effort to set up the sites, contracts, ethics, staffing. There are very few implementation RCTs in the literature that provide evidence for moving research into clinical practice.

Heather Gainforth

Gainforth HL, Shwed A, Giroux EE, Hoekstra F, McKay RC, Schaefer L, West CR, McPhail LT, Sibley KM, McBride CB, Munro B, Kaiser A. IKT Guiding Principles Partnership, SCI Guiding Principles Consensus Panel (2024). Transforming research systems for meaningful engagement: a reflexive thematic analysis of spinal cord injury researchers' barriers and facilitators to using the Integrated Knowledge Translation Guiding Principles. *Disability & Rehabilitation*. doi.org/10.1080/09638288.2024.2310171



This paper identifies individual, relational, and institutional barriers that need to be addressed to support meaningful engagement in SCI research.

Stacy Elliott and Andrei Krassioukov

Shackleton C, Samejima S, Miller T, Sachdeva R, Parr A, Samadani U, Netoff T, Hocaloski S, Elliott S, Walter M, Darrow D, Krassioukov A. Effect of epidural spinal cord stimulation on female sexual function after spinal cord injury. *Front Neurosci*. 2023 Apr 5;17:1155796. doi: 10.3389/fnins.2023.1155796. PMID: 37179555; PMCID: PMC10167769.



This is an important study due to its groundbreaking approach in treating sexual dysfunction in women with spinal cord injuries—a notably underrepresented group in clinical studies. This research presents promising results from the use of epidural spinal cord stimulation, showing significant enhancements in sexual function and reduced distress. It exemplifies our commitment to innovative, inclusive research that aims to improve quality of life across the entire SCI community.

Brian Kwon

Fehlings MG, Moghaddamjou A, Evaniew N, Tetreault LA, Alvi MA, Skelly AC, Kwon BK. The 2023 AO Spine-Praxis Guidelines in Acute Spinal Cord Injury: What have we learned? What are the critical knowledge gaps and barriers to implementation? *Global Spine J*. 2024 Mar;14(3_suppl):223S-230S. doi: 10.1177/21925682231196825.

This was an international collaborative effort that I led with Michael Fehlings to establish new guidelines for the timing of surgical decompression, the hemodynamic management of acute SCI, and the diagnosis and management of intra-operative SCI. The special issue includes 10 manuscripts related to the guidelines.

Corree Laule

Morris SR, Vavasour IM, Smolina A, MacMillan EL, Gilbert G, Lam M, Kozlowski P, Michal CA, Manning A, MacKay AL, Laule C. Myelin biomarkers in the healthy adult brain: Correlation, reproducibility, and the effect of fiber orientation. *Magn Reson Med*. 2023 May;89(5):1809-1824. doi: 10.1002/mrm.29552.

Measuring myelin—the fatty sheath that safeguards our nerve cells—is key to understanding human childhood development, the aging process, and a host of central nervous system diseases. In this research, we used three novel MRI techniques, each with a unique contrast mechanism, to quantify myelin levels across 17 distinct white matter regions of the brain in healthy adults. By comparing these MRI methods, we uncovered similarities and differences, and investigated trends linked to white matter fiber orientation. This work sets the stage for important clinical applications, providing a healthy brain reference for myelin MRI research into a wide array of neurological conditions.

Kathleen Martin Ginis

Martin Ginis KA, Gee CM, Sinden AR, Tomasone JR, & Latimer-Cheung AE. (2023). Relationships between sport and exercise participation and subjective well-being among adults with physical disabilities: Is participation quality more important than participation quantity? *Psychology of Sport and Exercise*. <https://doi.org/10.1016/j.psychsport.2023.102535>

In this large national sample of people with SCI and other physical disabilities, we demonstrated that the quality of people's physical activity participation experiences are more important than the amount of time they spend on physical activity, when it comes to aspects of subjective well-being such as life satisfaction, social and psychological well-being. These results speak to the importance of ensuring people with SCI experience valued outcomes including autonomy, belonging, engagement, challenge, mastery and meaning during their sport and exercise experiences.

Ben Mortenson

Jeawon M, Hase B, Miller S, Eng JJ, Bundon A, Chaudhury H, Maffin J, Clarkson R, Wright J, Mortenson WB (2023). Exploring the quality of life of people with incomplete spinal cord injury who can ambulate. *Disabilities*. 3(4): 455-476.

Supported by ICORD Seed funding and planned in close collaboration with knowledge users from the very beginning of the research project, this article presents what we learned about the experiences, needs, and strengths of individuals with incomplete spinal cord injury who can ambulate, as well as what kinds of supports and services they would like to be able to access. Twenty-four participants were interviewed and also completed standardized measures of function and life satisfaction, and the qualitative data was analyzed thematically. Individuals with incomplete SCI who can ambulate often live with impairments that are often not acknowledged by family, friends, healthcare professionals, and people with complete spinal cord injury. They also may feel excluded from activities organized by spinal cord organizations that have been designed primarily with the needs of individuals with complete SCI in mind. Findings indicate that there is ample room for service providers to improve their inclusion of ambulatory individuals with SCI. Suggestions include designing programs specifically for the needs of this population, in areas such as community, healthcare, return to work, and peer support; using principles of universal design to ensure spaces are accessible; and mindfully considering the perspectives of individuals with Incomplete SCI who ambulate in the above areas.



Ipec Oruc

Delavari P, Ozturan G, Yuan L, Yilmaz O, Oruc I. (2023). Artificial intelligence, explainability, and the scientific method: A proof-of-concept study on novel retinal biomarker discovery. *PNAS Nexus*, 2(9): 1-14.

In this paper we introduced and validated an AI-powered methodology for retinal biomarker discovery. This paper was featured in VCHRI Research Insider in March 2024.

Chris West

West CR (2024). Enter Sandman: An eye opening opinion of cardiovascular disease prevention in cervical spinal cord injury. *The Journal of physiology*, 602(2), 253-255.

In this manuscript I approach the current thinking of cardiovascular physiology in the setting of spinal cord injury through the lens of Metallica. The first paragraph includes quite a few Metallica album names!

David Wilson

Jones CE, Cibere J, Qian H, Zhang H, Guo Y, Russell D, Forster BB, Wong H, Esdaile JM, Wilson DR; IMPAKT-HiP study team. T1Gd is reduced in bone marrow lesions overlying cartilage in the hip. *Osteoarthritis Cartilage*. 2023 Oct;31(10):1405-1414.

This paper in an important journal provides important insight into the role of bone marrow lesions in Osteoarthritis.

See Appendix: Selected Publications by ICORD Principal Investigators for more publication information.

People

Student highlights

Four new awards were presented at the 2023 ICORD Trainee Symposium in October, honouring people who embody the attributes – beyond excellence in publications and presentations – that make a trainee or scientist outstanding.

- **ICORD Trainee Outstanding Service Award: Nicole Bailey.** This award recognizes trainees who have made outstanding contributions to the ICORD community. While also completing her Masters degree, Nicole Bailey dedicated herself to the ICORD community, with two years as co-Chair of the ICORD Trainee Committee (2022 and 2023), and also single-handedly organized the 2021 Trainee Symposium. She co-developed a new Research Liaison position to help match interested people with ICORD research studies, and served on the hiring committee for the new director.
- **Gabriel Dix SCI Community Award: Cameron Gee.** This award honours individuals actively making a difference in the lives of people living with SCI. Kwon and Martin Ginis Labs postdoc Cameron Gee has been an active and dedicated member of ICORD, consistently contributing to the SCI community for 11 years. Cam has volunteered as a sit ski instructor with Vancouver Adaptive Snow Sports, with British Columbia Wheelchair Sports Association wheelchair rugby and tennis tournaments, at SCI-BC events, as well as Canada's para-athletics and para-surfing teams. He also played an important role within the ICORD trainee committee from 2017 to 2019, fostering a sense of community and camaraderie among fellow trainees. This award is named for Gabriel Dix, a former trainee and staff member in the Martin Ginis Lab before his death in 2021.
- **Wolfram Tetzlaff Mentorship Award: Sarah Wheeler.** This award acknowledges the hard work and dedication of mentors to make students feel supported and encouraged, and was presented to Sarah Wheeler, who is a PhD student in the Tetzlaff lab. Adjudicators received an overwhelming number of nominations for Sarah from current and former students and colleagues in praise of her kindness, patience, thoroughness, adaptability, and genuine concern for the students she trains. She provides guidance, assists with scholarship and grad school applications, and fosters a positive learning environment with dozens of co-op students and volunteers. She also regularly follows up with past students after their departure from ICORD to provide career and academic advice. This award is named for Dr. Wolfram Tetzlaff, who served as director of ICORD from 2012 to 2023.
- **Peggy Assinck Award: Mary Fossey.** This award recognizes ICORD students who best exemplify perseverance, dedication, resilience and passion for SCI research. In February 2022, Mary was diagnosed with invasive ductal carcinoma. After undergoing chemotherapy, immunotherapy, surgeries and radiation during a year-long medical leave, Mary has returned to life as a PhD student. She has shifted her research focus from physiology to the emerging field of bio-informatics. Her passion for studying secondary complications post-SCI remains strong and her PhD will focus on the heart transcriptome post-SCI, especially identifying new biomarkers and treatments aimed at improving heart function post-injury. Her journey through a life-changing health diagnosis and switching fields from physiology to bio-informatics demonstrates a remarkable resilience. Mary also has been actively fundraising for cancer research (over \$6,400 so far!). This award was named for scientist and para-athlete Peggy Assinck, who completed her PhD with Dr. Wolfram Tetzlaff in 2016.



Nicole Bailey



Cameron Gee



Sarah Wheeler



Mary Fossey

Researcher highlights

This year, ICORD was able to support Dr. Michael Berger's Health Professional- Investigator's Award with matching contribution using the Best & Brightest funds. This Health Research BC award program is designed to develop BC's research talent and help decrease the gap between health research and its implementation. The award supports health professionals who are actively involved in patient care to conduct and apply research relevant to health and/or the health system.

Drs. Ryan Hoiland, Femke Hoekstra, Jan Rosner and Soshi Samajima joined ICORD as Associate Members in 2023-2024. Drs. Hoiland, Hoekstra, and Samajima all completed post-doctoral studies with ICORD PIs and became Assistant Professors this past year: Dr. Hoiland in Critical Care Medicine and Neurosurgery at UBC, Dr. Hoekstra in the Centre for Chronic Disease Prevention and Management at UBCO, and Dr. Samajima in the Department of Rehabilitation Medicine at the University of Washington. We look forward to their continued collaborations in SCI research at ICORD. Dr. Jan Rosner is a collaborator of Dr. John Kramer. He is a clinician-scientist in neurology and is the Group Leader of the University of Bern's Stroke Research Centre.

Awards and distinctions for ICORD researchers include:

- UBC Faculty of Medicine Distinguished Achievement Awards:
 - Dr. Ben Mortenson for overall excellence, mid-career
 - Dr. Myp Sekhon for Clinical Faculty Award for Excellence in Research - Early Career
- Dr. Babak Shadgan for Outstanding Academic Achievement from the Dean of Medicine
- Dr. Andrei Krassioukov received the Martin M. Hoffman Award for Excellence in Research from the UBC Department of Medicine
- Dr. Kathleen Martin Ginis was named to the Royal Society of Canada
- Dr. Brian Kwon received a new Tier I Canada Research Chair in Spinal Cord Injury
- Dr. Brett Hilton was named a Michael Smith Health Research BC Scholar and Dr. Mike Berger received the Michael Smith Health Research BC Health Professional Investigator award
- Dr. Heather Gainforth was honored as UBCO's Researcher of the Year for health research
- The Integrated Knowledge Translation Partnership won a CIHR-IMHA Inclusive Research Excellence Prize



Dr. Brett Hilton and members of his research team



Dr. Babak Shadgan with his research team

ICORD's Principal Investigators

Researchers whose primary research programs are closely aligned with the mission of ICORD

Dr. Michael Berger | Clinical Assistant Professor, Physical Medicine and Rehabilitation | UBC

Dr. Jaimie Borisoff | Director, MAKE+ Applied Research, Adjunct Professor, former Canada Research Chair in Rehabilitation Engineering Design, Applied Research | BCIT / UBC

Dr. Andrea Bundon | Associate Professor, Kinesiology | UBC

Dr. Victoria Claydon | Professor, Biomedical Physiology and Kinesiology | SFU

Dr. Jacquelyn Cragg | Assistant Professor, Pharmaceutical Sciences | UBC

Dr. Peter Crompton | Professor, Co-Director - Orthopaedic and Injury Biomechanics Group, Mechanical Engineering / School of Biomedical Engineering / Orthopaedics | UBC

Dr. Marcel Dvorak | Cordula and Gunter Paetzold Chair in Spinal Cord Clinical Research | Orthopaedic Spine Surgeon, Professor, Orthopaedics (Spine), Division of Spine, Orthopaedics | UBC / VCHRI / VCH

Dr. Stacy Elliott | Clinical Professor; Medical Consultant to Sexual Health Rehabilitation Services, VCH; Co-Director Vancouver Sperm Retrieval Clinic; Sexual Health Lead, Prostate Supportive Care Program, Prostate Centre, Psychiatry; Urologic Sciences | UBC / VCHRI / VCH

Dr. Janice Eng | Professor, Co-Director, Centre for Aging SMART, Physical Therapy | UBC / GF Strong Rehab Centre

Dr. Susan Forwell | Professor, Occupational Science and Occupational Therapy; Research Associate, Neurology, Faculty of Medicine | UBC / VCH

Dr. Heather Gainforth | Associate Professor, School of Health and Exercise Sciences | UBCO

Dr. David Granville | Professor, Pathology and Laboratory Medicine | UBC

Dr. Brett Hilton | Assistant Professor, Cellular and Physiological Sciences | UBC

Dr. Veronica Hirsch-Reinshagen | Assistant Professor, Pathology and Laboratory Medicine | UBC

Dr. Piotr Kozlowski | Professor; Director, Magnetic Resonance Imaging Research Centre; Research Scientist, Radiology; Urologic Sciences | UBC

Dr. John Kramer | ICORD Interim Director, Associate Professor, Anesthesiology, Pharmacology, and Therapeutics | UBC

Dr. Andrei Krassioukov | Patrick Reid Chair in Spinal Cord Rehabilitation Research; ICORD Associate Director, Rehabilitation Research; Professor, Medicine | ICORD/UBC

Dr. Brian Kwon | ICORD Associate Director, Clinical Research; Professor/Canada Research Chair/Spine Surgeon/ Research/Director Spine Research Program, Orthopaedics, Medicine | UBC / VCH

Dr. Tania Lam | Professor, Kinesiology | UBC

Dr. Cornelia Laule | ICORD Associate Director, Education and Training; Professor, Radiology; Pathology and Laboratory Medicine; Physics & Astronomy | Vice Chair, Research - Radiology | Director, UBC MRI Research | Co-Chair, seed2STEM Summer Research Program for Indigenous Youth | UBC

Dr. Kathleen Martin Ginis | Professor, Department of Medicine; School of Health and Exercise Sciences | Director, SCI Action Canada | Director, Centre for Chronic Disease Prevention and Management | UBCO

Dr. Bill Miller | Professor, Occupational Science and Occupational Therapy, Medicine | UBC

Our Vision:

Make spinal cord injury preventable, livable, & curable.

Our Mission:

Conduct research and training towards the development and translation of more effective strategies to promote prevention, functional recovery, and improved quality of life after spinal cord injury.

Dr. Wayne Moore | Clinical Professor, Pathology & Laboratory Medicine | UBC / VCH
 Dr. Ben Mortenson | Professor and Head, Occupational Science and Occupational Therapy | UBC, SFU
 Dr. Mark Nigro | Clinical Professor, Urologic Sciences | UBC / VCH
 Dr. Ipek Oruc | Associate Professor, Ophthalmology | UBC
 Dr. Tom Oxland | Professor, Co-Director - Orthopaedic and Injury Biomechanics Group Orthopaedics; Mechanical Engineering | UBC
 Dr. Matt Ramer | Lyall Knott BC Neurotrauma Professor; Associate Professor, Zoology; Neurosurgery | UBC
 Dr. Babak Shadgan | Assistant Professor, Orthopaedics | UBC / VCH
 Dr. Dena Shahriari | Assistant Professor, Orthopaedics; School of Biomedical Engineering | UBC / VCH
 Dr. Lynn Stothers | Professor, Urologic Sciences | UBC / VCH
 Dr. Wolfram Tetzlaff | Professor, Zoology; Surgery | UBC
 Dr. Darren Warburton | Professor, Kinesiology; Experimental Medicine | UBC
 Dr. Cheryl Wellington | Professor and Vice Chair, Research, Pathology and Laboratory Medicine | UBC
 Dr. Chris West | Associate Professor, Cellular and Physiological Sciences | UBCO
 Dr. Stephanie Willerth | Canada Research Chair in Biomechanical Engineering; Professor, Mechanical Engineering and Medical Science | UVic
 Dr. David Wilson | Professor, Orthopaedics | UBC
 Dr. Lyndia Wu | Assistant Professor, Mechanical Engineering | UBC

Investigators

Researchers whose primary research programs are peripherally aligned with the mission of ICORD

Dr. Phil Ainslie, Centre for Heart, Lung & Vascular Health, UBC
 Dr. Mohsen Akbari, Mechanical Engineering, UVic
 Dr. Hugh Anton, Physical Medicine & Rehabilitation, UBC/ VCH
 Dr. Gary Birch, Neil Squire Society
 Dr. Sean Bristol, Surgery, UBC
 Dr. Erin Brown, Plastic Surgery, UBC/VCH
 Dr. Mark Carpenter, Kinesiology, UBC
 Dr. Karen Cheung, Electrical and Computer Engineering, UBC
 Dr. Anita Delongis, Psychology, UBC
 Dr. Christopher Doherty, VCH
 Dr. Kayla Fewster, Kinesiology, UBC
 Dr. Josh Giles, Mechanical Engineering, UVic
 Dr. Tal Jarus, Occupational Science & Occupational Therapy, UBC

Dr. Shannon Kolind, Neurology, UBC
 Dr. Jasmin Ma, Kinesiology, UBC
 Dr. John Madden, Electrical and Computer Engineering, UBC
 Dr. Tim O'Connor, Kinesiology, UBC
 Dr. Scott Paquette, Surgery, UBC/VCH
 Dr. Jacqueline Quandt, Pathology and Laboratory Medicine, UBC
 Dr. Jane Roskams, Zoology, UBC
 Dr. Mypinder Sekhon, Critical Care Medicine, UBC/VCH
 Dr. Bill Sheel, Kinesiology, UBC
 Dr. Carolyn Sparrey, Mechatronics System Engineering, SFU
 Dr. John Street, Orthopaedics, UBC/VCH
 Dr. Andrea Townson, Physical Medicine and Rehabilitation, UBC/ VCH

Associate Members

Researchers who collaborate with ICORD PIs

Dr. Tim Bhatnagar, BCCHR
 Dr. Mike Boyd, VCH
 Dr. Romeo Chua, UBC
 Dr. Jens Coorsen, U Western Sydney
 Dr. Kerry Delaney, UVic
 Dr. Femke Hoekstra, UBCO
 Dr. Ryan Hoiland, UBCO
 Dr. Andy Hoffer, SFU
 Dr. Judy Illes, UBC
 Dr. Tim Inglis, UBC
 Dr. Megan McGillivray, St. Francis Xavier U
 Dr. Mohamed Javan, Tarbiat Modares U
 Dr. Andrew Laing, U Waterloo
 Dr. Nan Liu, Peking U
 Dr. Freda Miller, UBC
 Dr. Michael Negraeff, VCH
 Dr. Tom Nightingale, U Birmingham
 Dr. Aaron Phillips, U Calgary
 Dr. Soshi Samejima, U Washington
 Dr. Bonita Sawatzky, UBC
 Dr. Miriam Spering, UBC
 Dr. Paul van Donkelaar, UBC
 Dr. David Whitehurst, SFU
 Dr. Rhonda Willms, VCH

Emeritus Members

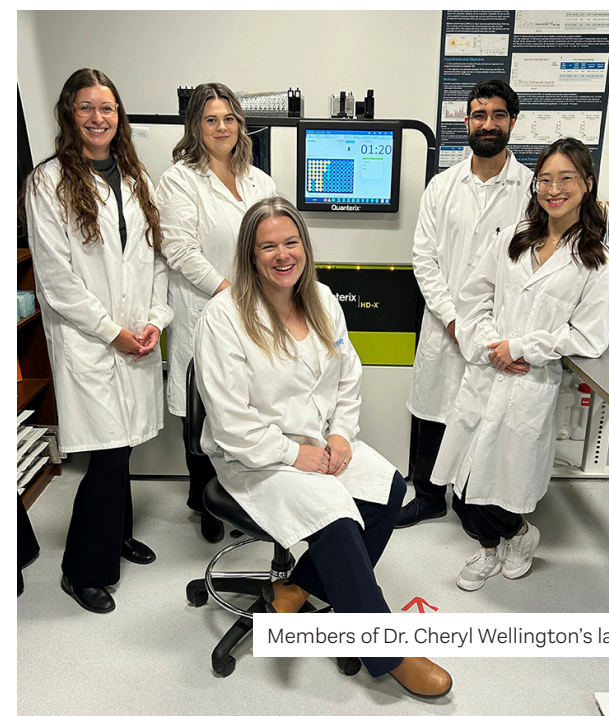
Dr. Tom Grigliatti
 Dr. Catherine Pallen
 Dr. John Steeves (Founding Director)
 Dr. E. Paul Zehr



Dr. Dena Shahriari with her research team



Research Liaisons Alison Williams (L) and Sam Douglas (R)



Members of Dr. Cheryl Wellington's lab



is a world-leading health research centre focused on spinal cord injury. From the lab-based cellular level of understanding injury to rehabilitation and recovery, our researchers are dedicated to the development and translation of more effective strategies to promote prevention, functional recovery, and improved quality of life after spinal cord injury. Located at Vancouver General Hospital in the Blusson Spinal Cord Centre, ICORD is supported by the Rick Hansen Foundation, UBC Faculties of Medicine and Science, and Vancouver Coastal Health Research Institute.



FACULTY OF MEDICINE



Thank you for reading our 2023-24 Annual Report.

Prepared by Cheryl Niamath. **Contributors:** Nancy Thorogood, Katie Ashwell, Elijah Sun, Jin Wang, Florencia Jacobs, Paul Joseph.

For additional copies of this report or any other ICORD publication, please call 604-675-8844 or email admin@icord.org.

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