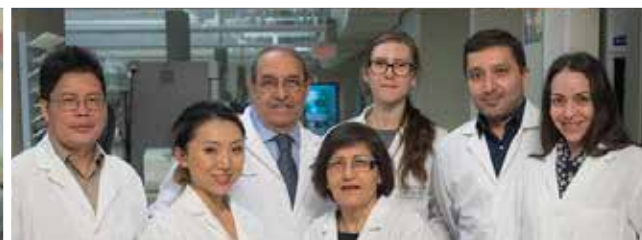
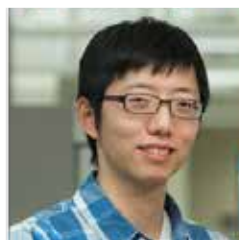
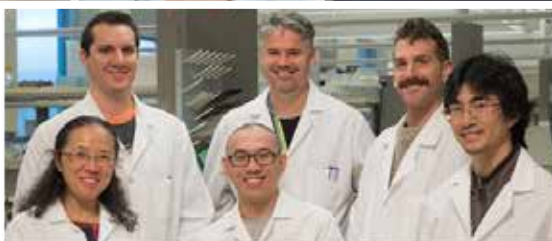
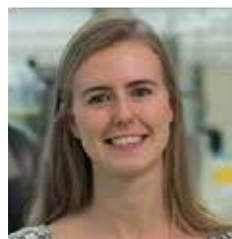


icord



ANNUAL REPORT 2018-19



THE UNIVERSITY OF BRITISH COLUMBIA

Message from ICORD's Director

It is my great pleasure to present this annual report, covering ICORD's accomplishments from April 1, 2018 to March 31, 2019.

I'm pleased to report that ICORD underwent a five-year internal review by the Faculty of Medicine in the past year, receiving a positive review of our performance and recognition of our accomplishments as one of the leading centres in SCI research both in terms of bibliometrics, H-indexes, and funding, as well as our universal dedication to, and enthusiasm for, making a positive impact on the lives of people with SCI. I am also pleased that we continued to receive the unwavering support from the Rick-Hansen Foundation without which we could not run many of our programs.

In the past year, ICORD has welcomed two new principal investigators: Dr. Lyndia Wu is an Assistant Professor in Mechanical Engineering who studies the biomechanics of mild traumatic brain injury, and Dr. Babak Shadgan is an Assistant Professor in Orthopaedics who is developing a new method for continuous monitoring of spinal cord hemodynamics and oxygenation in people with acute SCI. Dr. Shadgan is supported by a Michael Smith Foundation for Health Research scholarship combined with funding from the Blusson Integrated Cures Partnership (see page 8 for details on this Rick Hansen Foundation-funded initiative). I also continue to collaborate with colleagues in other departments to recruit new faculty members to our centre.

This has been a year of milestones, both for the research centre and for myself. Along with our colleagues in the Brenda and David McLean Integrated Spine Clinic and the Rick Hansen Institute, we celebrated the tenth anniversary of the opening of the Blusson Spinal Cord Centre with a series of events (see next page), as well as a building-wide photoshoot on September 18, 2018 (the front cover of this report includes images of ICORD staff, faculty, trainees, and volunteers captured that day).

On a personal note, in addition to the public celebrations of the anniversary of the building, I also marked my 30th year in my professional career as faculty doing research into neural regeneration, neuroprotection, and more recently, remyelination after spinal cord injury. Over the past three decades, the basic SCI research field has identified many molecules and pathways responsible for secondary injury progression and for the axonal regeneration failure; the emergency medicine and spine surgery field have made great progress in treatment of the acutely injured patients; and the physiatry and rehabilitation fields have made great strides towards better treatments of the multiple conditions that make living with SCI difficult or even life-threatening. ICORD's researchers and clinicians had a significant share in these. Still, there remains a lot to be done, and as I start my second term as ICORD Director, I feel very fortunate to lead such a productive and collaborative group all working to make spinal cord injury preventable, liveable, and curable together.

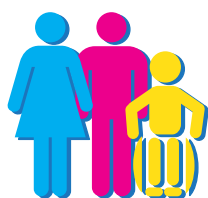
I hope you enjoy reading about our past year in the following pages.



WOLFRAM TETZLAFF, MD, PHD
PROFESSOR, ZOOLOGY & SURGERY, UBC



ICORD at a glance, April 2018–March 2019



People: 615

Researchers: 69

PIs: 46
Investigators: 10
Assoc. members: 13
Emeritus: 3

Staff: 112

Research/tech: 104
Admin: 8

Trainees: 316

Undergrads: 120
Masters: 102
PhD: 62
Postdocs: 29
Residents: 3

Volunteers: 118



Funding: 19,704,313

Competitively-funded

research grants held by
ICORD PIs: **18,298,063**
(including 14,591,675 for SCI-
related research projects)

Blusson Integrated Cures

Partnership: 1,106,250

UBC: 300,000



Publications: 465

including **265 peer-reviewed
journal articles** (51 of which
had multiple ICORD authors)

Highlights, 2018-19

The BSCC turned ten

The Blusson Spinal Cord Centre, home to ICORD, the Rick Hansen Institute, and the Brenda & David McLean Integrated Spine Clinic, officially opened in November, 2008. To celebrate the tenth anniversary of the opening of the building, two events were held:

On October 18, we gathered with stakeholders to officially mark the occasion. Speakers included John Chernesky of the Rick Hansen Institute, Philanthropist Dr. Stewart Blusson, ICORD Founding Director Dr. John Steeves, ICORD Associate Director and spine surgeon Dr. Brian Kwon. Rick Hansen gave the keynote address. Afterwards, guests visited a variety of displays showcasing projects currently taking place in the building.

On November 16, we held a celebration for all the staff, faculty, students, volunteers, and research participants who spend their time in the Blusson Spinal Cord Centre. We are grateful to Dr. Brian Kwon for his contribution towards the event, Tayybeh for the delicious food, Fuse Wheelchair Dance for the performance and mini-lesson, and Promosapien, Bean Around the World VGH, and Tractor Everyday Healthy Foods for door prizes. Thanks also to the many staff and students who volunteered at the event, and special thanks to Dean of Medicine Dr. Dermot Kelleher, who took time out of his busy schedule to join us and give a short keynote.

Women in science celebrated

February 11, 2019, was declared the International Day for Women and Girls in Science by the United Nations, and ICORD held a special event in celebration. Despite the unexpected snow, more than a hundred people came to the Blusson Spinal Cord Centre to see posters by ICORD women and displays by the Society for Canadian Women in Science and Technology and IEEE (Institute of Electrical & Electronics Engineers) Women in Engineering. Dr. Lesley Shannon, NSERC Chair for Women in Science and Engineering (BC & Yukon), gave a keynote about her own career path and the gender-related challenges she has faced. She then joined Drs. Gail Murphy (UBC VP Research & Innovation, UBC), Zena Sharman (Director, Strategy, MSFHR), and Mali Meibod (Medical Science Liaison, AstraZeneca), for a panel discussion moderated by Faydra Aldridge (Director, Stakeholder Relations, VCHRI). Generous support for this event was provided by



Above: photos from the official 10th Anniversary event on October 18, 2018; below: Fuse Wheelchair Dance demo/class on November 16, 2018.



Drs. Sharman, Shannon, Murphy, and Meibod with Ms. Aldridge on February 11, 2019

the BICP, L'Oréal, Lazy Gourmet, VWR, Legacy Liquor Store, and Bean Around the World-VGH.

Also on February 11, the L'Oréal Foundation and UNESCO announced the 21st International Award For Women in Science, which honours outstanding women scientists from all over the world. These exceptional women are recognised for the excellence of their research in the fields of material science, mathematics and computer science. Their achievements were celebrated alongside those of 15 promising young women scientists from across the world, including ICORD postdoctoral fellow Dr. Jacquelyn Cragg, at an awards ceremony on March 14 at UNESCO's headquarters in Paris.

The global burden of neurological diseases has grown substantially over the past 25 years, as the world population expands and ages. Dr. Cragg, a postdoctoral fellow with Drs. John Kramer and Wolfram Tetzlaff, is using statistical algorithms to better understand the progression of such diseases, including Parkinson's disease, amyotrophic lateral sclerosis (ALS) and spinal cord injury. She is leveraging clinical and population "big data" sources and machine-based learning to identify novel, reliable predictors of disease progression, and understand how diverse factors interact to predict long-term outcomes. She aims to be a world leader in neuro-analytics, helping to uncover innovative treatment strategies and therapies for people suffering with neurological diseases.

New summer program for Indigenous high school students launched

Burnaby South Secondary Grade 11 student Eliana Bond joined ICORD for six weeks in the summer of 2018 as part of our pilot Summer Research Program for Indigenous Youth. She spent time working in the Ghahary, Tetzlaff, and Laule Labs, the Physical Activity Research Centre (PARC), and Human Locomotion Lab.

During the time she spent in PARC, Eliana did a qualitative research project about what the research centre means to the participants. With the guidance of graduate student Sharon Jang and support of Dr. Tania Lam, Eliana analyzed her data, prepared a research poster, and presented her poster at a special session on her last day at ICORD.

Eliana returned to present her work at our Annual Research Meeting in March, and earned an honourable mention in the Undergraduate poster prize category!

Following the success of our pilot program, we plan to expand the program for the summer of 2019.



Eliana presenting her research poster at ICORD's Annual Research Meeting in March, 2019

PARC collaborated with Vancouver Board of Parks and Recreation

In 2016, Swedish exercise experts Dr. Anna Bjerkefors and Mats-Erik Bjerkefors came to Vancouver on a BICP-funded international travel award to collaborate with Dr. Tania Lam and her team in PARC to develop workshops to train fitness leaders how to work with people with SCI. The PARC team successfully ran two pilot workshops in the summer of 2016: one for SCI peers and PARC students, and another for community trainers. They received great feedback as well as lots of requests for future training opportunities. Around the same time, the PARC team also launched an initiative to explore the feasibility and benefits of group exercise programs (spin classes, boxercise training, circuit training) for people with SCI.

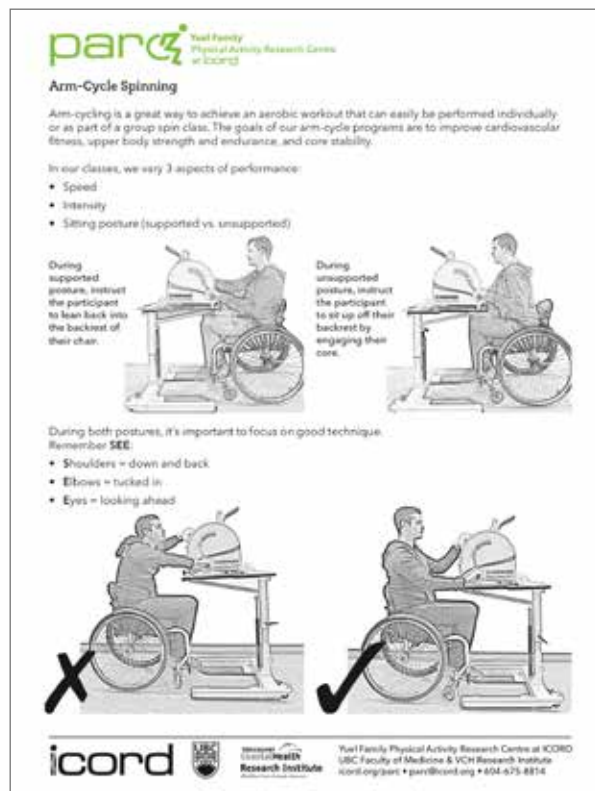


In 2017, PARC staff began collaborating with the Vancouver Board of Parks and Recreation, and the City of Surrey Parks, Recreation & Culture to provide training for their community fitness leaders on how to work with individuals with disabilities.

A staff inservice for nearly 40 Vancouver Community Centre trainers at ICORD in March 2018 was a huge success, and the pilot data that was collected showed a significant increase in the trainers' knowledge and confidence. Using data from the workshops with the Swedes and this inservice, Dr. Lam and her team successfully applied for a Michael Smith Foundation for Health Research Grant of \$10,000 to continue working with Vancouver and Surrey to train their trainers and assist in updating their facilities to be more inclusive.

Building on their experience offering adaptive spin classes at ICORD, the PARC team helped to establish an inclusive spin program at Vancouver's Champlain Community Centre and provided training to the instructor. The class offers the use of arm-cycles in addition to classic stationary bikes. Some PARC participants have started attending the weekly Champlain classes and have said they are awesome!

Over the summer of 2019, the PARC team plans to continue to work with Surrey and Vancouver on inclusive fitness initiatives. They will be helping Vancouver to create more inclusive circuit training classes, and providing fitness leaders in Surrey with weight room experience and practical skills around inclusive equipment, and they've also started discussions with the Cities of Burnaby and Coquitlam to begin partnerships with their community centres as well!



A page from Exercising with a Spinal Cord Injury, prepared for the Vancouver Board of Parks and Recreation inservice

ICORD in the Okanagan

ICORD-O is a team of scientists based at UBC Okanagan, with research interests that cut across the translational spectrum of research in the areas of SCI and TBI (traumatic brain injury). They have long-standing, strong collaborations with many Vancouver-based ICORD researchers. In the summer of 2018, ICORD-O officially welcomed Drs. Chris West (from ICORD Vancouver) and Jan van der Scheer to their team. Dr. West joined as an Assistant Professor in the Southern Medical Program and Dr. van der Scheer joined as a Research Associate in the SCI Action Canada Lab. With these two new appointments, ICORD-O grew to six members (including Drs. Phil Ainslie, Heather Gainforth, Kathleen Martin Ginis and Paul van Donkelaar).



From injury models to rugby players, the SCI work at ICORD-O focuses on the health and wellbeing of adults living with SCI. They have particular research expertise and interest in exercise as an intervention to improve cardiovascular health and psychosocial wellbeing; implementation science and integrated knowledge translation approaches to research; and the role of peer support in improving health and wellbeing.

New facilities including an adapted fitness training and testing research space, and an accessible research kitchen are helping to accelerate ongoing research programs.

With the growth of the team and the creation of these new research spaces, ICORD-O is uniquely positioned to conduct research using integrated knowledge translation approaches.

Research, 2018-19

Events

Trainee symposium

The eighth annual ICORD Trainee Symposium, organized and presented by ICORD's Trainee Committee, took place in May, 2018. More than 100 attendees heard from guest speakers Drs. Gordon Mitchell and Paul Zehr. There were ten awards for trainee research posters and presentations, including the Dr. Andrei Krassioukov Autonomic Award, which was won by Dr. Rahul Sachdeva of the Krassioukov Lab. The Trainee Symposium is supported by the Blusson Integrated Cures Partnership.



Autonomic Symposium

On February 13, 2019, ICORD PI Dr. Andrei Krassioukov hosted the 5th International Autonomic Symposium: *Women's Health after Spinal Cord Injury*. The event included research talks and consumer panels on the topic of crucial women's health issues after SCI, including sexual health,

pregnancy, postpartum health and aging, with speakers from Sweden, Denmark, China, Winnipeg, New Brunswick, Toronto, Kamloops and Vancouver. The event ended with an engaging Café Scientifique, held with the support of the Rick Hansen Institute and Spinal Cord Injury BC, who live-streamed the event.

Annual Research Meeting

ICORD's 16th Annual Research Meeting (ARM) took place on March 6 and 7 this year, with plenary speakers Drs. Amy Latimer-Cheung from Queen's University and James Grau from Texas A&M University. The ARM is an opportunity for ICORD faculty, staff, and trainees to hear from internationally-renowned SCI experts, share their research with each other, and develop new collaborations. This year's 1.5-day event had 177 registered participants, with 13 research talks by ICORD PIs, and 67 research posters presented by trainees and staff. We are grateful to the BICP for supporting the ARM.



Above: ARM poster prize winners with speakers; below left: Autonomic Symposium Café Scientifique; below right: ARM poster presenter and judges.



Publication highlights

Dr. Victoria Claydon and her team completed a three-year study on bowel care, and its relationship to autonomic dysreflexia and quality of life for people with SCI.

Inskip JA, Lucci VM, McGrath MS, Willms R, Claydon VE. A Community Perspective on Bowel Management and Quality of Life after Spinal Cord Injury: The Influence of Autonomic Dysreflexia. *J Neurotrauma*. 2018 May 1;35(9):1091-1105.

Dr. Andrei Krassioukov and postdoctoral fellow Dr. Rahul Sachdeva published an important review article on the connections between high rates of blood pressure dysregulation and high rates of cognitive impairment in people with SCI.

Sachdeva R, Gao F, Chan CCH, Krassioukov, AV. Cognitive function after spinal cord injury. *Neurology* Sep 2018, 91 (13) 611-621.

PhD student Freda Warner of Dr. John Kramer's lab published a paper providing historical benchmarks for estimating the progression of neuropathic pain during the first year after acute SCI. This information will be useful for comparison and evaluating safety during early phase acute SCI trials.

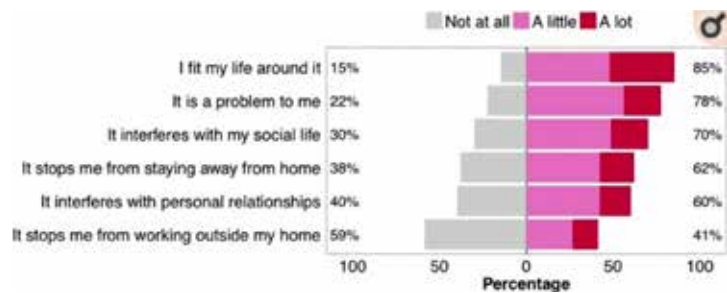
Warner FM, Cragg JJ, Jutzeler CR, Finnerup NB, Werhagen L, Weidner N, Maier D, Kalke YB, Curt A, Kramer JLK. Progression of neuropathic pain after acute spinal cord injury: a meta-analysis and framework for clinical trials. *Journal of Neurotrauma* 36(9) Published online: 18 Dec 2018

A group of ICORD researchers, working with international colleagues, determined a gene signature that is linked to the severity of SCI in animals and humans. The discovery of key genes that are switched on or off in response to SCI could inform the development of biomarkers that predict recovery and possibly pinpoint new targets for treatment. This collaboration was supported by a BICP International Exchange Award.

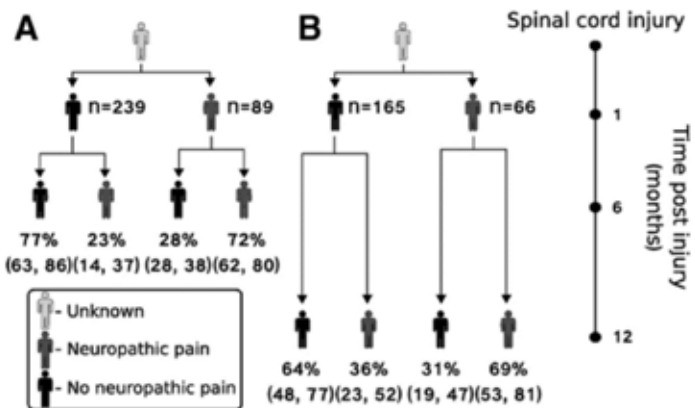
Squair JW, Tigchelaar S, Moon KM, Liu J, Tetzlaff W, Kwon BK, Krassioukov AV, West CR, Foster LJ, Skinnider MA. Integrated systems analysis reveals conserved gene networks underlying response to spinal cord injury. *Elife*. 2018; 7 e39188.

It has been long believed that myelin regeneration is a key therapeutic target to enhance function following SCI, but Dr. Wolfram Tetzlaff and his team demonstrated that the process of remyelination is not a crucial component or functional recovery, thereby raising doubts as to whether or not remyelination is a validated target for clinical translation following moderate spinal cord contusion.

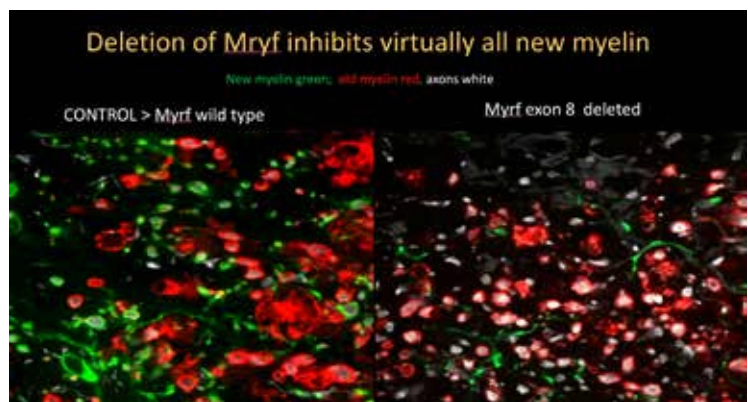
Duncan GJ, Manesh SB, Hilton BJ, Assinck P, Liu J, Moulson A, Plemel JR, Tetzlaff W. Locomotor recovery following contusive spinal cord injury does not require oligodendrocyte remyelination. *Nature Communications* 2018; 9(1):3066.



Impact of bowel management on respondents' life and activities (Inskip, et al)



The longitudinal progression of overall neuropathic pain. Estimates are pooled from the European Multi-Center Study about Spinal Cord Injury and the Swedish-Danish study and are evaluated from (A) 1-6 months, and (B) 1-12 months. (Warner, et al)



Inhibition of remyelination after spinal cord injury due to induced conditional knock out of Myrf. On the left, the normal wild type shows that close to 40% of the myelin is newly formed 42 days after spinal cord injury and can be seen as green rings (mGFP) around white axons (NF-200/SMI312). This remyelination is prevented by Myrf deletion and many axons (white) are without sheaths. The surviving and spared old myelin is stained in red (MBP). Despite this remyelination failure the recovery of locomotion was identical. (Duncan, et al)

Building capacity through the Blusson Integrated Cures Partnership

ICORD and the Rick Hansen Institute are working together to identify new treatments for SCI and apply existing treatments for other neurological disorders, injuries, and diseases, to SCI. Funded by the **Rick Hansen Foundation**, the **Blusson Integrated Cures Partnership (BICP)** provides stable funding for several multi-year research projects, new faculty positions within ICORD, international exchanges to encourage collaboration, such research-related events as the Annual Research Meeting and seminar series, and a consumer-engagement strategy to provide people with SCI and their supporters with evidence-based information about the healthcare, services, and resources available to best support recovery after SCI and increase consumer involvement in the research process.

With the support of the BICP, research towards a cure for SCI continued to be accelerated in 2018-19:

The SCI Biobank supports translational research in order to improve patient outcomes following SCI. The SCI Biobank currently holds approximately 15,000 blood samples, and approximately 13,000 cerebrospinal fluid (CSF) samples from 152 people. SCI Biobank data is being utilized by Dr. Cheryl Wellington (UBC) in an evaluation of proteins that are biomarkers of traumatic brain injury.

Dr. Christopher West and Dr. John (Kip) Kramer continued to make significant contributions to the field of SCI. Dr. West was recently appointed to the Chronic Disease Prevention Program (CDPP) in the Department of Cellular and Physiological Sciences at UBC Okanagan. Dr. West co-authored ten articles published in leading journals this year and four individuals in his lab received five awards. Dr. Kramer was the author or co-author of six articles published in leading journals this year, and two individuals in his lab received four awards.

Launched in 2017, the **SCIRE Community** website provides free information about SCI research written in everyday language. The website is now being used by a global audience with the most frequently viewed pages being Spinal Cord Anatomy, Urinary Tract Infections (and its new chapter launch) and Handouts in November 2018. An evaluation of the website was undertaken this year using website analytics, including 67 survey responses and 30 semi-structured interviews. The evaluation findings are being used to draft a manuscript for publication.

As part of **an international study comparing SCI data** from multiple registries, a meta-analysis of the data is underway for the European, Multi-Centre Study about Spinal Cord Injury (EMSCI), the North American Clinical Trials Network (NACTN) and the Rick Hansen Spinal Cord Registry (RHSCIR).

ICORD's seminar series invites renowned researchers to present on a variety of topics relating to SCI. In 2018-19, the following speakers presented seminars:

- Dr. Megan Cully (Nature Reviews Drug Discovery) What it takes to publish in Nature and to pursue an alternate career in journalism.
- Dr. Juan Aguilar (National Hospital For Paraplegics – Toledo, Spain) Characterizing neural activity in the somatosensory cortex to re-define cortical reorganization after SCI.
- Dr. Michael Beattie (UCSF) Translational SCI Research: from acute care and treatment to transplantation.
- Dr. David Magnuson (Kentucky Spinal Cord Injury Research Centre): Reverse Engineering the mammalian spinal cord: we don't know what we don't know.
- Dr. James Guest (Miami Project to Cure Paralysis): Internal decompression of the acutely injured spinal cord: dangerous or helpful?
- Dr. Monica Perez (Miami Project to Cure Paralysis) Neurophysiology guiding rehabilitation after spinal cord injury.
- Dr. Abel Torres (UCSF) A journey to the light: bringing spinal cord injury dark-data to shine.



ICORD's Researchers

Principal Investigators

Dr. Gary Birch | Executive Director, Neil Squire Society; Adjunct Professor, Electrical and Computer Engineering, UBC | **Focus:** Ensuring assistive technology is accessible to people with disabilities.

Dr. Paul Bishop | Clinical Professor, Orthopaedics, UBC | **Focus:** Biological mechanisms of spinal nerve root injury and myelopathy.

Dr. Jaimie Borisoff | Canada Research Chair in Rehabilitation Engineering Design; Research Director, British Columbia Institute of Technology; Adjunct Professor, Occupational Science and Occupational Therapy, UBC | **Focus:** Increasing participation through improved accessible equipment design.

Dr. Victoria Claydon | Associate Professor, Biomedical Physiology and Kinesiology, SFU | **Focus:** Impact of cardiovascular dysfunction on the quality of life of people with SCI.

Dr. Peter Crompton | Co-director, Orthopaedic and Injury Biomechanics Group, UBC; Professor and Associate Head – External, Mechanical Engineering, UBC; Associate Member, Orthopaedics, UBC | **Focus:** Mechanical and computational models of SCI; injury prevention.

Dr. Marcel Dvorak | Professor, Orthopaedics, UBC; Head, Div. Spine, Orthopaedics, UBC; Cordula and Günter Paetzold Chair in Clinical SCI Research, UBC; Scientific Director, Rick Hansen Institute; Medical Director, Combined Neurosurgical and Orthopaedic Spine Program (CNOSP), Vancouver General Hospital; Co-Chair, Spine Trauma Study Group | **Focus:** Adult traumatic spine injury surgery; optimizing clinical decision-making in acute SCI.

Dr. Stacy Elliott | Clinical Professor, Depts. of Psychiatry and Urologic Sciences, UBC; Medical Director, BC Centre for Sexual Medicine; Co-director, Vancouver Sperm Retrieval Clinic; Medical Director, Men's Sexual Assessment and Rehabilitation Service, Prostate Centre; Physician Consultant, GF Strong Sexual Health Rehabilitation Service | **Focus:** Sexual health after SCI; autonomic dysfunction during sexual activity, pregnancy, and childbirth.

Dr. Janice Eng | Professor, Physical Therapy, UBC | **Focus:** Web-based technologies designed to provide the SCI community with information about recovery and evidence-based treatments.

Dr. Susan Forwell | Associate Professor and Head, Occupational Science & Occupational Therapy, UBC | **Focus:** Fatigue, pain, mobility, and employment among the SCI and traumatic brain injury populations.

Dr. Heather Gainforth | Assistant Professor, Health and Exercise Sciences, UBC Okanagan | **Focus:** behaviour change; health promotion; kinesiology; knowledge translation.

Dr. Aziz Ghahary | Director, BC Professional Fire Fighters' Burn and Wound Healing Research Group; Professor, Surgery, Associate Member, Dermatology & Skin Sciences, UBC | **Focus:** Development of therapeutics for chronic non-healing wounds and autoimmune diseases.

Dr. David Granville | Professor, Pathology & Laboratory Medicine, UBC; Scholar of the Royal Society of Canada; Associate Director, BC Professional Firefighters' Burn and Wound Healing Research Laboratory, Plastic Surgery, UBC; Founder and Chief Scientific Officer, viDA Therapeutics Inc.; Adjunct Professor, Institute of Molecular Biology and Biochemistry, SFU | **Focus:** Role of granzymes in the healing of injured tissue, inflammation, and neuronal damage.

Dr. Andy Hoffer | Professor, Biomedical Physiology and Kinesiology, SFU; Associate Member, Engineering Science, SFU; Founder and Chief Scientific Officer, Lungpacer Medical Inc. | **Focus:** Prevention of the loss of voluntary diaphragm function in acute SCI; restoring diaphragm in ventilator-dependent, chronic SCI patients.

Dr. Reza Jalili | Assistant Professor, Surgery, UBC | **Focus:** Management of pressure ulcers and other chronic, non-healing wounds; improving cell viability and functionality in tissue wounds with an optimal extracellular matrix.

Dr. Piotr Kozlowski | Associate Director, Magnetic Resonance Imaging Research Centre, UBC; Associate Professor, Radiology and Urologic Sciences, UBC; Associate Member, Physics and Astronomy, UBC; Research Scientist, Vancouver Prostate Centre | **Focus:** Magnetic resonance imaging for the measurement of white matter damage.

Dr. John Kramer | Assistant Professor, Kinesiology, UBC; Scholar, Michael Smith Foundation for Health Research | **Focus:** Neuropathic pain medication and neurological recovery in SCI; open-access clinical trial data.

Dr. Andrei Krassioukov | Professor, Physical Medicine & Rehabilitation, UBC; Spinal Cord Injury Rehab Rehabilitation Chair and Associate Director, Rehabilitation Research, ICORD; Staff physician, Spinal Cord Program, GF Strong Rehabilitation Centre; President, American Spinal Injury Association (ASIA) | **Focus:** Management of autonomic dysreflexia after SCI; development and implementation of international Paralympic classifications.



Dr. Brian Kwon | Canada Research Chair in Spinal Cord Injury; Professor, Orthopaedics, UBC; Spine Surgeon, Vancouver Spine Program, Vancouver General Hospital; Associate Director, Clinical Research, ICORD; Director, Vancouver Spine Research Program, Marcel Dvorak Chair in Spine Trauma, Vancouver General Hospital | **Focus:** Proteomic, metabolomic, and genomic changes occurring after acute SCI; International SCI Biobank.

Dr. Tania Lam | Associate Professor, Kinesiology, UBC; Associate Director, Education, ICORD | **Focus:** Training functional community ambulation after SCI; robotic exoskeletons for rehabilitation.

Dr. Cornelia Laule | Associate Professor, Radiology and Pathology & Laboratory Medicine, UBC | **Focus:** Magnetic resonance imaging for quantitative measurements of myelin in the brain and spinal cord.

Dr. Kathleen Martin Ginis | Professor, Health & Exercise Sciences, UBC Okanagan; Director, SCI Action Canada; Principal Investigator, Canadian Disability Participation Project; Fellow, National Academy of Kinesiology | **Focus:** Physical activity behaviour change after SCI; increasing physical activity participation in the SCI community.

Dr. William Miller | Professor, Occupational Science & Occupational Therapy, UBC; Associate Dean, Health Professions Education, UBC | **Focus:** Optimizing mobility through the use of assistive technology.

Dr. Patricia Mills | Clinical Assistant Professor, Physical Medicine & Rehabilitation, UBC | **Focus:** Management of cardiovascular health and spasticity after SCI.

Dr. Wayne Moore | Clinical Professor, Pathology & Laboratory Medicine, UBC | **Focus:** Basic histopathology and immunopathology behind SCI; pathogenesis of multiple sclerosis.

Dr. W. Ben Mortenson | Associate Professor, Dept. of Occupational Science & Occupational Therapy, UBC; Adjunct Professor, SFU | **Focus:** Community participation among those with SCI; scooter-skills training on safety and participation.

Dr. Mark Nigro | Director, Provincial Organ Retrieval Program; Surgical Director of Renal Transplant, Vancouver General Hospital; Co-Director, Vancouver Ejaculatory Dysfunction Clinic; Clinical Professor, Dept. of Urologic Sciences, UBC | **Focus:** Home monitoring to reduce urinary tract infections.

Dr. Ipek Oruc | Assistant Professor, Dept. of Ophthalmology & Visual Sciences, UBC | **Focus:** Brain mechanisms behind higher-level vision; visual dysfunction caused by brain disorders (e.g., prosopagnosia, autism spectrum disorder).

Dr. Tom Oxland | Professor, Orthopaedics and Mechanical Engineering, UBC; Associate Head – Research, Orthopaedics, UBC | **Focus:** Evaluation of mechanical parameters to predict the degree of damage from SCI.

Dr. Scott Paquette | Clinical Assistant Professor, Dept. of Surgery, UBC | **Focus:** Spinal tumours and SCI; spine education and fellowship curriculum development.

Dr. Matt Ramer | BC Neurotrauma Chair, ICORD; Associate Professor, Dept. of Zoology, UBC | **Focus:** neuronal response to injury; repair mechanisms in the injured spinal cord.

Dr. Bonita Sawatzky | Associate Professor, Orthopaedics, UBC | **Focus:** Optimizing wheelchair functionality and use; longitudinal study of adults with Arthrogryposis Multiplex Congenita.

Dr. Babak Shadgan | Assistant Professor, Orthopaedics, UBC; Michael Smith Foundation for Health Research | **Focus:** bio-sensing; clinical biophotonics; musculoskeletal and sports medicine; near-infrared spectroscopy; neuroprotection; translational research

Dr. Carolyn Sparrey | Assistant Professor, Mechatronics System Engineering, School of Engineering Science, SFU | **Focus:** Improvement of animal injury models; wheelchair safety engineering.

Dr. Miriam Spering | Associate Professor, Ophthalmology & Visual Sciences, UBC | **Focus:** Visual cues to the brain for the control of movement; impact of neurological damage on vision and related motor responses.

Dr. Lynn Stothers | Professor, Urologic Sciences, and Member, Depts. of Healthcare and Epidemiology, and Anesthesiology, Pharmacology and Therapeutics, UBC | **Focus:** Improvement of bladder health after SCI.

Dr. John Street | Assistant Professor, Orthopaedics, UBC | **Focus:** Minimization and accurate recording of adverse events in SCI population.

Dr. Wolfram Tetzlaff | John & Penny Ryan BC Leadership Chair in Spinal Cord Research; Professor, Zoology and Surgery, UBC; Director, ICORD | **Focus:** Protection against secondary neural damage after SCI; facilitation of neural repair.

Dr. Darren Warburton | Co-Director, Physical Activity Line; Co-Director, Physical Activity Promotion and Chronic Disease Prevention Unit, UBC; Professor, Kinesiology, UBC | **Focus:** Effects of physical activity, exercise, and training on cardiovascular health.



Dr. Cheryl Wellington | Professor, Pathology and Laboratory Medicine, UBC | **Focus:** Mechanisms of neurodegeneration and injuries to the central nervous system.

Dr. Christopher West | Assistant Professor, Cellular & Physiological Sciences, UBC; Scholar | **Focus:** Mechanisms of changes to cardiovascular health in response to SCI; physical activity and exercises to mitigate cardiovascular damage.

Dr. David Whitehurst | Assistant Professor, Faculty of Health Sciences, SFU | **Focus:** Health economics; quality-of-life assessments for SCI population.

Dr. Stephanie Willerth | Associate Professor, Mechanical Engineering and Div. Medical Sciences, University of Victoria; Member, Centre for Advanced Materials & Related Technology |

Focus: Personalized neural tissue and biomaterial scaffolds for the treatment of neurological damage caused by SCI.

Dr. David Wilson | Associate Professor, Orthopaedics; Associate Member, Mechanical Engineering, UBC | **Focus:** Joint mechanics; improvement of surgical treatments for SCI.

Dr. Lyndia Wu | Assistant Professor, Mechanical Engineering, UBC. **Focus:** concussion; head impact sensing; soft tissue biomechanics; traumatic brain injury.

Dr. E. Paul Zehr | Professor & Director, Centre for Biomedical Research, Division of Medical Sciences, School of Exercise Science, University of Victoria | **Focus:** Neural control of ambulation; science communication.

Investigators

Philip Ainslie | Professor, School of Health and Exercise Sciences, UBC Okanagan; Canada Research Chair in Cerebrovascular Physiology; Co-Director, Centre for Heart, Lung & Vascular Health, UBC-O. | **Focus:** Cardiovascular health; cerebral blood flow regulation; cerebrovascular function.

Hugh Anton | Clinical Professor, Physical Medicine and Rehabilitation, UBC; Clinical Research Coordinator, GF Strong Rehabilitation Centre | **Focus:** community involvement; fatigue; outcome measures; physical medicine; quality of life; rehabilitation.

Mark Carpenter | Professor, Kinesiology, UBC | **Focus:** balance; EEG; falling; fear; postural control.

Anita Delongis | Associate Professor, Psychology, UBC | **Focus:** chronic disease; coping; mental health; social support; stress.

Tal Jarus | Professor, Occupational Science and Occupational Therapy, UBC | **Focus:** locomotor training; mental health; occupational performance.

Shannon Kolind | Assistant Professor, Neurology, UBC | **Focus:** axons; central nervous system; disease; inflammation; injury; MRI; myelin; neurodegeneration.

Tim O'Connor | Professor, Cellular and Physiological Sciences, UBC | **Focus:** neural development; regeneration.

Jane Roskams | Professor, Zoology, UBC | **Focus:** neural development; olfaction; regeneration.

William Sheel | Professor, Kinesiology, UBC | **Focus:** cardiovascular health; exercise; rehabilitation; respiration; sport cardiology.

Andrea Townson | Clinical Associate Professor and Head, Physical Medicine and Rehabilitation, UBC: Medical Site Lead, GF Strong Rehab Centre; Attending Physician, SCI Rehabilitation Program, GF Strong Rehab Centre | **Focus:** community involvement; fatigue; high tetraplegia; non-traumatic SCI; outcome measures; physical medicine.

Associate members

Mike Boyd | Orthopaedic Surgery, UBC

Romeo Chua | Kinesiology, UBC

Jens Coorssen | Health Sciences & Biology, Brock University

Kerry Delaney | Biology, University of Victoria

Tim Inglis | Kinesiology, UBC

Mohammad Javan | Physiology, Tarbiat Modares University, Tehran, Iran

Andrew Laing | Kinesiology, University of Waterloo

Nan Liu | Rehabilitation Medicine, Peking University Third Hospital, Beijing, China

Freda Miller | Molecular Genetics and Physiology, University of Toronto & Hospital for Sick Children

Michael Negraeff | Anesthesiology, Pharmacology & Therapeutics, UBC

Aaron Phillips | Cardiac Sciences and Clinical Neurosciences, University of Calgary

Paul Van Donkelaar | Health & Exercise Sciences, UBC-O

Rhonda Willms | Physical Medicine and Rehabilitation, UBC



Thank you for reading our 2018-19 Annual Report.

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