

international spinal cord injury regeneration
social media transplantation knowledge translation
collaboration parapalympics education
quality of life repair breakthroughs leadership
pre research stem cells biomaterials assessment
rehabilitation neuroprotection trainees
partnership discoveries cure

icord

INTERNATIONAL COLLABORATION ON REPAIR DISCOVERIES
ANNUAL REPORT 2012-13



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

from the director



The past year brought some interesting challenges to ICORD's leadership: the director search that started in 2011 was ongoing, availability of sufficient operating funding beyond March 2013 was uncertain, and we were preparing for our first external research centre review.

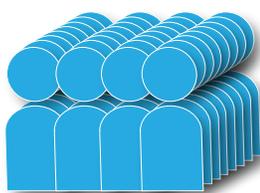
I'm happy to report that these challenges have been successfully weathered (I have accepted the position of Director, the Rick Hansen Foundation has promised \$20 million for cure-related SCI research—see page 11—and ICORD received a very positive review from the external panel), and, as you will learn in the following pages, we had some time to do some research as well!

I'd like to thank the members of ICORD's Executive (page 10)—and indeed all of my ICORD colleagues and our trainees and staff—for their support over the past year as I've adapted to my leadership role. I look forward to working towards an even more productive and successful ICORD in the next year and into the future.

Dr. Wolfram Tetzlaff
ICORD Director

ICORD at a glance 2012-13

Researchers: 50



Principal Investigators: 32

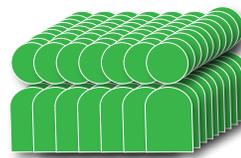


Investigators: 9



Associate Members: 9

Staff: 83

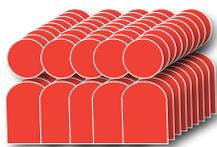


Research & technical: 64

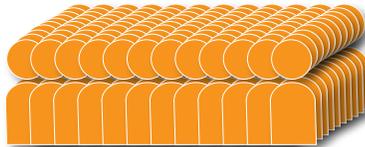


Admin & Clerical: 19

Trainees: 196



Undergraduates /other: 45



Grad students: 120

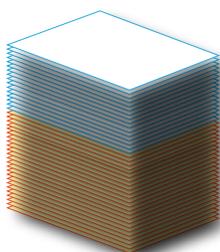


Postdoctoral fellows: 28



Residents: 3

All publications: 384



peer-reviewed journals & book chapters: 229

Total competitive research grant funding: \$12.4m



SCI-related grants: \$7.8m

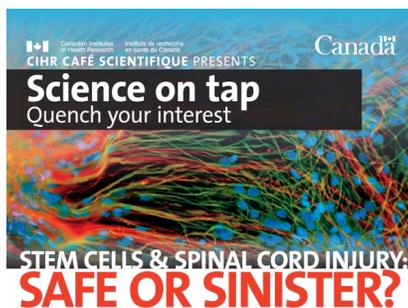
Operating funding: \$1.1m



program highlights

Cafe Scientifique

ICORD trainees Leanne Ramer and Jacqueline Cragg were awarded grants from the Canadian Institute for Health Research (CIHR) in both 2011 and 2012 to host free, informal discussions on SCI-related issues of popular interest to the general public. Since the initial award, four Café Scientifique events have taken place, all in the Blusson Spinal Cord Centre atrium. They were all very well-attended, with waiting lists for each. *Stem Cells and Spinal Cord Injury: Safe or Sinister?* took



place in May, 2012, with speakers Drs. Brian Kwon and Wolfram Tetzlaff of ICORD and Dr. Marleen Eijkholt of the Centre for Applied Ethics at UBC. *Paralympic Wheelchair Athletes: Struggles Behind the Gold* in November, 2012, featured Drs. Andrei Krassioukov, Chris West and Jaimie Borisoff. At each event, ICORD trainees joined members of the public to chat about their own

research and answer questions. Sincere thanks to Dr. Chris McBride of SCI-BC for moderating two events, Fernando Romero of SCI-BC for facilitating webcasts of three events, and Jacqueline Cragg for her tireless and enthusiastic work coordinating this popular program.

Community Resource Centre

The Community Resource Centre in the BSCC atrium provides information about ICORD research as well as welcoming visitors to the BSCC and providing directions when necessary. Resource Centre volunteers also prepare lay summaries of recently-published SCI papers, which are posted on the blog section of the ICORD website, and respond to comments posted by interested readers. Since 2011, there have been 50 volunteers who have worked a total of almost 1900 hours at the Resource Centre. Funding for the centre comes from funds raised at the annual *Spinal Chord* Gala, along with contributions from SCI-BC (\$5,000 in 2011) and the Rick Hansen Institute (\$5,000 in 2012).

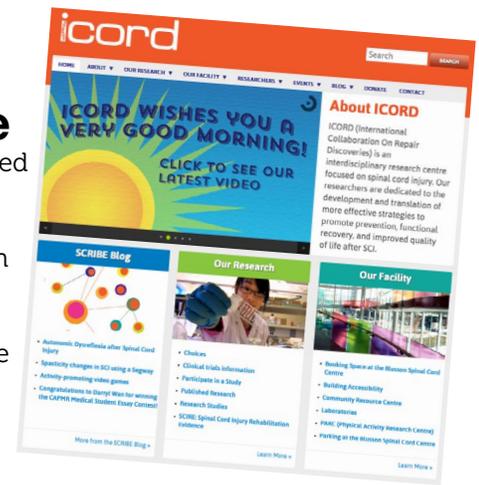
New website

We unveiled a redesigned ICORD website during the summer of 2012.

The new site is done on a Wordpress platform which makes it easy to add content and update information in-house.

Highlights of the site include an **expanded researcher section**,

with a separate profile page for each PI, Investigator and Associate Member and an RSS feed showing each researcher's 5 most recent papers in PubMed; better information about ongoing and currently-recruiting research studies; and the SCRIBE Blog, curated by the SCI Resource Centre with **easy-to-understand summaries** of SCI-related research papers. With new social media connections, it is easy for visitors to the site to **share ICORD stories** on Facebook, Twitter, Pinterest, and many other social media options.



Staff Awards

Spinal Chord Awards for Staff Excellence celebrate the work done by ICORD staff, and are made possible through funds raised at the *Spinal Chord* Gala. Staff members can be nominated for a particularly well-done task or project, or for overall excellence in the performance of their duties. Two \$500 awards, one for Service and one for Research, are presented annually.

Ms. Jennifer Douglas-Mills won the 2013 award for **Service Excellence**.

She is the Research Manager for the Orthopaedic and Injury Biomechanics Lab. She was nominated by members of her research group for her consistent dedication, her strong work ethic and the very high quality of her work. She was also praised highly for her problem-solving skills.

Dr. Jie Liu won the 2013 award for **Research Excellence**.

He has been a Research Associate in Dr. Tetzlaff's laboratory for more than 15 years. He is generous in sharing his knowledge with ICORD trainees and staff, and has been involved in countless collaborative research projects. His surgical skills are invaluable to the research group. In fact, in one letter of nomination, he was described as being the "central motor" of the lab.



research highlights

Research Awards

In honour of the ongoing fundraising for ICORD done by the students at W.L. McLeod Elementary School in Vanderhoof, BC, ICORD renamed a travel and research prize for Masters students the **W.L. McLeod Trainee Award**.

Each year at ICORD's Annual Research Meeting, Postdoctoral Fellows, PhD and Masters students present posters describing their work, and compete for three awards for excellence in research. The awards allow the trainees to travel to conferences to present their research and get feedback from national and international experts in spinal cord injury.

The W.L. McLeod Award was formerly the ICORD Trainee Award. The first **W.L. McLeod Award** was presented at ICORD's 2013 Annual Research Meeting to **Raymundo Aguas-Hernandez** of Dr. Jane Roskams' lab (honourable mention: Mayank Kalra)

Other trainee awards:

The **Aaron Moser Award** goes to the best poster presented by an ICORD trainee at the Doctoral Student level. This award is named for Aaron Moser, who suffered a spinal cord injury in 1988 while playing hockey for the Nanaimo Clippers. After his injury, his teammates and friends set up a trust fund to raise money for Aaron's expenses. The Aaron Moser Spinal Cord Injury Foundation was started with the remaining funds, to raise money toward spinal cord research and, ultimately, to find a cure for paralysis. The 2013 Aaron Moser Award went to **Megan O'Neil**, also of Dr. Roskams' lab (honourable mention: Hannah Gustafson). The **Gordon Hiebert Award** is presented for the best poster by an ICORD trainee at the Postdoctoral Fellow or Resident level. This award is named in memory of former ICORD trainee, Dr Gordon Hiebert. Gord came to ICORD in 1996 for his postdoctoral training, joining the labs of Drs. Wolfram Tetzlaff and John Steeves, later moving to Saskatoon and then Edmonton to continue his research. On May 26, 2004, SCI research lost a friend and colleague when Gord passed away at the age of 36 following a battle with cancer. Along with his significant scientific contributions, Gord will be remembered as a friend to all who knew him. The 2013 Gordon Hiebert Award was presented to **Dr. Chris West** of Dr. Andrei Krassioukov's lab (honourable mention: Dr. Reza Jalili).

New for 2013 was an award for the best poster presented by an ICORD staff member (Research Assistant, Technician or Research Associate). The 2013 **ICORD Staff Award** went to **Dr. Femke Streijger**, a research associate in Dr. Brian Kwon's lab (honourable mention: Gita Gholamrezaei).



Enjoying the Annual Research Meeting: (top left) Neda Manouchehri & Gita Gholamrezaei; (top right) Michele Hubli & Katharine Currie; (centre) Cameron Lam, Stephen Mattucci & Jessica Inskip; (bottom) Peggy Assinck & Adele Field-Fote.

Annual Research Meeting

ICORD's 10th Annual Research Meeting took place on March 5th and 6th, 2013, with invited plenary speakers **Dr. Edele Field Fote**, Professor, Departments of Physical Therapy and Neurological Surgery at the Miami Project to Cure Paralysis, and **Dr. Phil Popovich**, Professor, Department of Neuroscience and Director of the Center for Brain and Spinal Cord Repair at Ohio State University.

ICORD Trainees and staff presented 33 posters on an impressive range of topics (see poster award winners above), research talks by eight ICORD PIs and two trainees, and a special talk focusing on problems facing people with SCI in developing countries.

Seed grant update

A \$200,000 investment in ICORD's Seed Grant program by the **Rick Hansen Foundation** in 2011-12 has led to more than \$1.3 million in committed and awarded funds. ICORD awarded 10 Seed Grants in 2011-12. Of those 10 grants, 7 resulted in grant applications to external funding agencies. 4 of these applications were successful, 2 are still in review, and one was unsuccessful. Grants were awarded by the Rick Hansen Foundation, CIHR, Heart and Stroke Foundation and Craig Neilsen Foundation. One notable seed grant project by **Dr. Brian Kwon** has become a central strategy of the **Blusson Integrated Cure Partnership** between ICORD and the Rick Hansen Institute. Dr. Kwon's seed grant enabled his team to identify a series of human biomarker molecules that serve as indicators of the characteristics of a spinal cord injury, and relate them to clinical outcomes such as the severity of paralysis. Another seed grant successfully grew an international collaboration to test a valuable, low-tech neuroprotective treatment for SCI. **Dr. Wolfram Tetzlaff** received a seed grant to determine which genes are affected by the ketogenic diet, a low-carb, high-fat diet recently identified by Dr. Tetzlaff to have neuroprotective qualities. This screen for genetic sensitivity to this diet allowed Dr. Tetzlaff to develop the protocol for his successful 2012 Canada-China Partnership grant from the **Canadian Institutes of Health Research**, where he will work with partners in China to conduct pre-clinical research on the ketogenic diet that is required to enable this treatment to move forward into clinical trials. With a seed grant to investigate cardiovascular autonomic control in acute SCI, **Dr. Victoria Claydon** was able to conduct a pilot study, testing people with SCI from within a few days to one year post-injury to identify the damage to cardiovascular nerves after SCI, and how these changes happen over time. This pilot study allowed Dr. Claydon to the necessary background data to conduct a larger, more in-depth study, successfully funded by the **Heart & Stroke Foundation of Canada**.

ICORD Seminar Series

With funding generously provided by the **Rick Hansen Institute**, ICORD presented eight guest speakers during the past year:

Dr. Malka Itzkovitch, Tel Aviv University. *The development of SCIM, SCI-ARMI, and SCIM grades: Instruments for assessment and efficient reporting of SCI rehabilitation outcomes.*

Dr. Yuri Danilov, University of Wisconsin–Madison. *New approach to neurorehabilitation: cranial nerve noninvasive neuromodulation (CN-NINM technology).*

Dr. Timothy Murphy UBC. *Imaging and optogenetic tools for studying cortical circuit structure and function in healthy brain and after stroke.*

Dr. David Ditor Brock University. *Cardiovascular dysfunction and secondary tissue damage after SCI: Evidence for a novel neuroprotective strategy.*

Dr. Noritaka Kawashima Research Institute of National Rehabilitation Center for Persons with Disabilities, Tokyo. *Toward the recovery of locomotor function after spinal cord injury.*

Dr. Erin Brown UBC/VCH. *The peripheral nervous system: injury, repair, & recovery.*

Dr. Duane Cronin University of Waterloo. *Advanced finite element modeling: human response and injury prediction.*

Dr. Yong Hu University of Hong Kong & Chinese Academy of Medical Sciences & Peking Union Medical College. *Neural Engineering and its application in spinal disorders.*

Visiting Scholars

Research Engineering Scientist **Zin Khaing** came from the University of Texas (Austin) to work with **Brian Kwon** and **Wolfram Tetzlaff** as part of the ICORD Distinguished Visiting Scholar program in the summer of 2012. Her project involved advanced biomaterials for cell transplantation therapies.

Orthopedic surgeon **Xiaoliang Kenny Wu** is from Southern Medical University of China. He is now working in Dr. Tetzlaff's lab as part of the ICORD's Scholarship for International Trainees of 2012. His project involves ketogenic diet therapy for SCI.

Paralympic Clinic

During London 2012 Paralympic Games, **Dr. Andrei Krassioukov** and his research team, with the support of the International Paralympics Committee, successfully set up and operated a **Cardiovascular Health Education Clinic for Paralympic athletes**. The project was funded by the Craig Neilsen Foundation and ICORD. During the 12 days of clinic, the team evaluated 63 Paralympic athletes from 15 countries around the world. In addition to Paralympic athletes, the clinic was visited by team physicians, physical therapists, and nurses. To date this is the largest study conducted with Paralympic athletes during a major international event. The main goal of the clinic was to educate athletes and members of the team on various aspects of the cardiovascular and autonomic dysfunctions that individuals with SCI could face during training and competition including autonomic dysreflexia, orthostatic hypotension, and boosting.



L-R: Chris West (ICORD), Greg Vice (IPC Standing Committee), Dmitry Krassioukov (ICORD), Andrei Krassioukov (ICORD), Walt Thompson (IPC Standing Committee), Yves Vanlandewijck (IPC Standing Committee), Melissa Pak (ICORD), Shirley Wong (ICORD), Jacquelyn Cragg (ICORD).

traineeupdate

ICORD's Trainees are the next generation of SCI researchers, and they are an energetic and enthusiastic group. On top of their coursework and

degree-related research projects, members of the **Trainee Committee** work year-round organizing research and social events, reaching out to the community, and providing input into ICORD's governance. Their involvement enriches the environment at ICORD and is integral to ICORD's success as a research centre. **The 2012-13 Trainee Committee Executive:** Chair: Peggy Assinck; **Trainee Representative on the ICORD Executive:** Jessica Inskip; **Outreach Coordinators:** Jacquelyn Cragg and Andre Fallavollita; **Trainee Seminar Organizer:** Greg Duncan; **Secretary:** Diana Hunter; **ITC Symposium Coordinators:** Chris West, Brett Hilton, and Simon Bedard; **Social Coordinators:** Steve Mattucci and Moreza Bahar; **Communications:** Mark Crawford and Hannah Gustafson. Visit www.icord.org for up-to-date information about trainee activities and awards.



Trainees throughout ICORD participate in **journal clubs** which are small groups of trainees and supervisors that meet to critically discuss recently published research. Here, the CanWheel Productivity Club meets to discuss a journal article. L-R: Dr. Ben Mortenson, Ed Giesbrecht, Dr. Bonnie Sawatzky, Krista Best, Paula Rushton, Megan MacGillivray, Debbie Field, Brodie Sakakibara (with Dr. Bill Miller on the telephone). Missing from picture: Bitu Imam and Mahsa Sadegh

Organized and executed entirely by trainees, the 2nd annual **ICORD Trainee Symposium** in May 2012 was a great success. Trainees at all stages in their research presented along with invited speakers Dr. Keith Tansey and Dr. David Shreiber. The Organizing Committee with invited speakers. L-R: Tim Bhatnagar, David Shreiber, Jason Plemel, Rhian Ravensburgen, Rachel Liu, Simon Bedard, Keith Tansey, Jessica Inskip



Trainees graciously represented ICORD at the 4th annual **Spinal Chord Gala** in November, 2012, helping with many aspects of the event and speaking with guests about the research they are doing. See page 12 for more about the gala.

With proceeds from a bake sale, trainees were able to take part in the **Hoopfest** tournament supporting wheelchair basketball programs in BC.

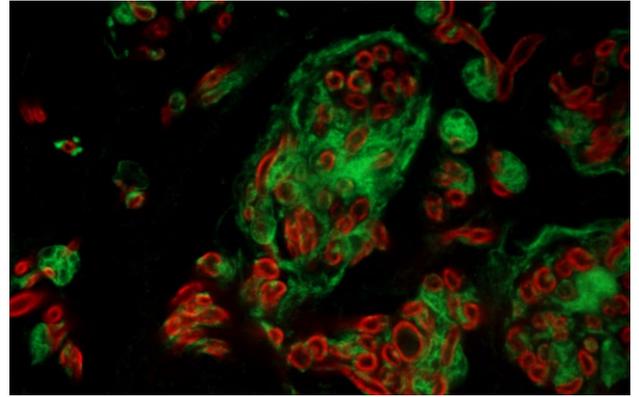




Nathan Michaels is finishing his undergraduate thesis with Dr. Wolfram Tetzlaff

Following SCI, the specialized *Schwann cells* that insulate axons in the peripheral nervous system often appear in the injured spinal cord, where they re-insulate spared axons that have lost their insulation, promoting functional recovery. My undergraduate thesis project is to determine where these Schwann cells come from in

order to better understand this natural repair process and develop methods to enhance it.



This image shows Schwann cells in the spinal cord following SCI that came from stem cells that normally do not produce Schwann cells.

Robyn Newell is a PhD student with Dr. Peter Cripton

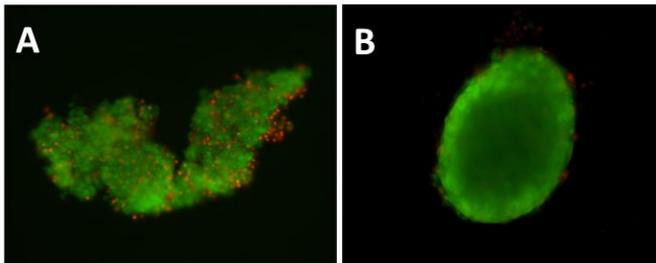
In my research on *injury prevention*, one of my projects looked at whether our necks move differently when we are bracing for a crash or colliding with a player during sports. I measured the posture of the spine and the muscle response of human volunteers when they braced for impact



and when they were upside down. This information is important for the development of protective devices since neck injuries often occur when people are bracing for impact or are upside down.



Azadeh Taba is a PhD student with Dr. Aziz Ghahary

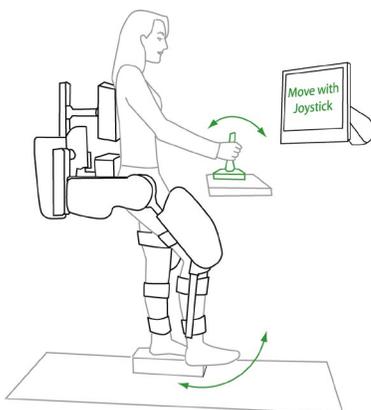


For my thesis project, I'm developing a type of *biomaterial scaffold* that can improve the survival of transplanted cells without the need for anti-rejection drugs. My research focuses on transplantation of insulin-producing cells to aid people with Type 1 diabetes, and, if successful, this technology will help us understand how to design biomaterial scaffolds to support transplantation of other types of cells to treat conditions such as non-healing wounds (a serious secondary complication of SCI).



This image shows transplanted pancreatic cells with (B) and without (A) a biomaterial scaffold. The cells maintain their healthy shape when embedded in the scaffold.

Antoinette Domingo is a Postdoctoral Research Fellow with Dr. Tania Lam



Proprioception is a type of sensory feedback that is important for maintaining posture, locomotion, and motor learning. The purpose of my research project was to develop an accurate and reliable tool to measure proprioceptive sense in the legs using the Lokomat, a robotic exoskeleton, in persons with spinal cord injury. This tool will help to develop treatments to improve sensory function and with the goal of maximizing skilled walking and community ambulation.

This illustration depicts how the Lokomat is used to measure proprioceptive sense in the legs. The Lokomat has motors that can move the hips and knee joints at different speeds and to specified positions. Participants used a joystick controller to change the hip or knee angles when asked to replicate target positions. This bypasses variations in the voluntary control over the lower limb between individuals when testing proprioceptive sense.



ICORDresearchers

Welcome

Drs. Patricia Mills and **Ben Mortenson** joined ICORD as new Principal Investigators in 2013. **Dr. Mills** is a physician scientist at both ICORD and the GF Strong Rehabilitation Centre. Her research will evaluate whether electrical stimulation of the brain can improve blood pressure control in individuals with SCI, which, among other things, would improve their ability to engage in physical rehabilitation. **Dr. Mortenson** studies outcome measures, social participation, and assistive technology, for older adults living in residential care and individuals living with SCI.

Congratulations

Dr. Brian Kwon was awarded a **Canada Research Chair** in Spinal Cord Injury in October, 2012. With this Chair, Dr. Kwon plans to continue his innovative translational research program with an emphasis on investigations that will impact the lives of people who have suffered a spinal cord injury.

Nominated by students, colleagues, and alumni, **Dr. Peter Crompton** won a **UBC Killam Prize** in 2012 for excellence in teaching.

Dr. Andrei Krassiokov was inducted into the prestigious **Canadian Academy of Health Sciences**.

Dr Tom Oxland received a **Humboldt Research Award** allowing him to spend a year collaborating with Dr. Hans-Joachim Wilke at the Universitaet Ulm, in Germany.

Dr. Janice Eng received a **Distinguished Achievement Award** from the UBC Faculty of Medicine in 2012.

Dr. Bonnie Sawatzky received a **Distinguished Alumni Blazer Award** from the Canadian Mennonite University (CMU) in Winnipeg, Manitoba.

In January, 2013, **Dr. Sue Forwell** was named **Scholar in Residence** and awarded the **Barbara Sexton Lectureship** from the University of Western Ontario's Department of Occupational Therapy.

Drs. Brian Kwon, Stacy Elliott and **Jaimie Borisoff** were presented with **Queen Elizabeth II Diamond Jubilee Medals** in 2013.

ICORD's Principal Investigators

Dr. Gary Birch | Executive Director, Neil Squire Society; Adjunct Professor, UBC Department of Electrical and Computer Engineering. Research focus: accessibility; brain-computer interface; biological signal processing; EEG; technology design.

Dr. Paul Bishop | Clinical Associate Professor, Orthopaedics UBC. Research focus: clinical trials; nerve root injury; outcome measures; pain; quality of life.

Dr. Jaimie Borisoff | Canada Research Chair in Rehabilitation Engineering Design, Applied Research, BCIT. Research focus: accessibility; mobility; rehabilitation; sensory substitution; wheelchair design.

Dr. Victoria Claydon | Assistant Professor, Biomedical Physiology and Kinesiology, SFU. Research focus: cardiovascular health; fainting; high altitude.

Dr. Peter Crompton | Associate Professor & Patrick Campbell Chair in Design, Mechanical Engineering, UBC. Research focus: concussion; helmet performance; hip injury; injury biomechanics; injury prevention; orthopaedic biomechanics; pre-clinical trials; Spinal cord injury; spine trauma

Dr. Marcel Dvorak | Professor & Head, Div. Spine, Orthopaedics, UBC / VCH. Research focus: outcome measures; traumatic SCI.

Dr. Stacy Elliott | Clinical Professor, Psychiatry & Urologic Sciences UBC; Medical Director, BC Centre for Sexual Medicine and Medical Consultant to Sexual Health Rehabilitation Services, VCH. Research focus: autonomic dysreflexia; fertility; plasticity; sensory substitution; sexual rehabilitation.

Dr. Janice Eng | Professor, Physical Therapy UBC / VCH. Research focus: clinical trials; knowledge translation; occupational therapy; physical therapy; stroke.

Dr. Sue Forwell | Assistant Professor, Occupational Science and Occupational Therapy UBC. Research focus: chronic disease; fatigue; occupational therapy; pain; rehabilitation.

Dr. Aziz Ghahary | Professor, Surgery / B.C. Professional Fire Fighters' Burn and Wound Healing Lab; Associate Member, Dermatology and Skin Science, UBC / VCH. Research focus: cell transplantation; diabetes; scaffold; skin substitute; wound healing.

Dr. Tom Grigiatti | Professor, Life Sciences Institute, Zoology, and Pharmaceutical Sciences UBC. Research focus: proteomics.

Dr. Andy Hoffer | Professor, Biomedical Physiology and Kinesiology, SFU. Research focus: diaphragm pacing.



Rick Hansen presenting the Queen Elizabeth II medal to Dr. Elliott.

Dr. Sandra Hundza | Assistant Professor, Exercise Science, UVic. Research focus: aging; ambulation; balance; locomotor training; rehabilitation.

Dr. Piotr Kozlowski | Associate Professor, Radiology & Urologic Sciences, UBC. Research focus: diagnosis; MRI; myelin; plasticity; prostate cancer.

Dr. Andrei Krassioukov | Professor, Physical Medicine & Rehabilitation, UBC / VCH. Research focus: autonomic dysreflexia; cardiovascular health; knowledge translation; locomotor training; sexual rehabilitation.

Dr. Brian Kwon | Canada Research Chair in Spinal Cord Injury; Associate Professor, Div. Spine, Orthopaedics, UBC / VCH. Research focus: biomarkers; clinical trials; neuroprotection; spine surgery; translational research.

Dr. Tania Lam | Associate Professor, Kinesiology UBC. Research focus: ambulation; locomotor training; outcome measures; plasticity; robotics.

Dr. Bill Miller | Professor, Occupational Science and Occupational Therapy, UBC. Research focus: aging; fatigue; mobility; self-efficacy; wheelchair use.

Dr. Patricia Mills | Clinical Assistant Professor, Physical Medicine & Rehabilitation UBC. Research focus:

Dr. Wayne Moore | Clinical Professor, Pathology and Laboratory Medicine, UBC / VCH. Research focus: MRI, pathology of MS.

Dr. Ben Mortenson | Assistant Professor, Occupational Science and Occupational Therapy, UBC. Research focus: outcome measures, social participation, assistive technology.

Dr. Mark Nigro | Clinical Professor, Urologic Science, UBC; Co-director, Vancouver Ejaculatory Dysfunction Clinic. Research focus: infertility; organ transplantation.

Dr. Tom Oxland | Professor, Orthopaedics & Mechanical Engineering, UBC. Research focus: aging; mechanical testing; orthopaedic biomechanics; rehabilitation; surgical implants.

Dr. Scott Paquette | Clinical Assistant Professor, Div. Spine, Dept of Orthopaedics, UBC; Neurosurgeon, VCH. Research focus: pain.

Dr. Matt Ramer | Associate Professor, Zoology & Neurosurgery, UBC. Research focus: pain; plasticity; regeneration; sensory neurons; sympathetic neurons.

Dr. Bonita Sawatzky | Associate Professor, Orthopaedics, UBC. Research focus: fatigue; mobility; Segway use; tire pressure; wheelchair use.

Dr. Carolyn Sparrey | Assistant Professor, Mechatronic Systems Engineering, School of Engineering Science, SFU. Research focus: biomaterials; biomechanics; injury prevention; modeling.

Dr. John Steeves | Professor, ICORD, UBC. Research focus: arm and hand rehabilitation; clinical trials; myelin; outcome measures; plasticity.

Dr. Lynn Stothers | Professor, Urologic Sciences UBC / VCH. Research focus: Near Infrared Spectroscopy.

Dr. John Street | Assistant Professor, Orthopedics, UBC, co-Medical Director, Complex Spine Program & Clinical Lead, Integrated Ambulatory Spine Program, VGH. Research focus: helmet performance; injury prevention.

Dr. Wolfram Tetzlaff | Professor, Zoology & Surgery UBC. Research focus: cell transplantation; diet; myelin; neuroprotection; regeneration.

Dr. Darren Warburton | Associate Professor, Kinesiology and Experimental Medicine UBC. Research focus: cardiovascular health; chronic disease; clinical exercise rehabilitation; rehabilitation; sport cardiology.

Dr. Stephanie Willerth | Assistant Professor, Mechanical Engineering and Medical Science, UVic. Research focus: biomaterials; regeneration; scaffold; stem cell; tissue engineering.

Dr. Paul Zehr | Professor & Director, Rehabilitation Neuroscience Laboratory, UVic. Research focus: ambulation; coordination; neural control; rehabilitation; stroke.

ICORD's Investigators

Dr. Hugh Anton | Clinical Professor, Medicine UBC / VCH. Research focus: community involvement; fatigue; outcome measures; quality of life; rehabilitation.

Dr. Mark Carpenter | Associate Professor; Tier II CRC, Kinesiology UBC / VCHRI. Research focus: balance; EEG; falling; fear; postural control.

Dr. Anita Delongis | Associate Professor, Psychology, UBC. Research focus: chronic disease; coping; mental health; social support; stress.

Dr. Tal Jarus | Professor & Head, Occupational Science and Occupational Therapy UBC. Research focus: locomotor training; mental health; occupational performance.

Dr. Tim O'Connor | Professor, Cellular & Physiological Sciences, UBC. Research focus: neural development; regeneration.

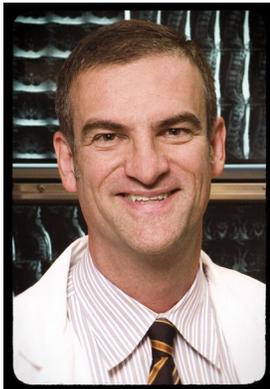
Dr. Jane Roskams | Professor, Zoology & Neuroscience, UBC. Research focus: neural development; olfaction; regeneration.

Dr. Bill Sheel | Professor, Kinesiology UBC. Research focus: cardiovascular health; rehabilitation; respiration; sport cardiology.

Dr. Andrea Townson | Clinical Associate Professor & Head, Physical Medicine and Rehabilitation, UBC; Medical Site Lead, GF Strong, VCH. Research focus: community involvement; fatigue; high tetraplegia; non-traumatic SCI; outcome measures.

A list of recent publications is available as an appendix to this report on the ICORD web site (www.icord.org).

chairholderreports



Dr Marcel Dvorak

The **Cordula and Gunter Paetzold Chair** allows Dr. Marcel Dvorak's full schedule as a spine surgeon, educator and leader to include research into the clinical problems he sees in his patients with SCI and to mentor junior clinical faculty members in research. This year, Dr. Dvorak's pioneering data registry on patients with SCI and their recovery published data that is being used to improve patient outcomes through better timing to surgery. Dr. Dvorak also published several papers with ICORD researchers advancing research into possible therapies for human treatment and evaluating surgical implants, and was recognized by the North American Spine Society for his exceptional leadership in clinical spine research this year.



Dr Matt Ramer

The **BC Neurotrauma Professorship** has enabled Dr. Ramer's dedication to research and training that resulted in four publications in 2012, which identified the contradictory interactions of several body systems in regenerating after injury that result in the most troublesome complications of SCI. Dr. Ramer's work has pointed out how these interactions are confounding current efforts to cure SCI and will improve the lives of people with SCI by refocusing currently unsuccessful cure efforts on single therapeutics to identifying these interacting neural changes in different body systems after injury, and designing personalized treatments to address these effects to finally achieve spinal cord regeneration and cure.



Dr Wolfram Tetzlaff

Dr. Wolfram Tetzlaff's busy year was made possible by the **Rick Hansen Man-In-Motion Chair** allowing him time to travel to build international partnerships, promote Canadian leadership in SCI research, and to share research knowledge with people with SCI. Dr. Tetzlaff forged a partnership with physicians in China to exchange scientists and research procedures and prepare for tandem pre-clinical trials of the high fat, low carbohydrate ketogenic diet (already used in epilepsy) to aid in neural recovery in acute SCI. This strategy also received funding from an innovative CIHR Canada-China Partnership Grant. Dr. Tetzlaff's pioneering work will enable clinical trials for patients with SCI, and he presents extensively on SCI research to people with SCI including through Café Scientifique and webinars for Spinal Cord Injury BC.

ICORD **executive** 2012-13

Acting Director: Dr. Wolfram Tetzlaff

Associate Directors:

- **Education:** Dr. Tania Lam
- **Clinical Research:** Dr. Marcel Dvorak
- **Rehabilitation Research:** Dr. Andrei Krassioukov
- **Preclinical Discovery Research:** Dr. Aziz Ghahary

Managing Director: Dr. Lowell McPhail

Communications & Administrative Manager: Ms. Cheryl Niamath

ICORDpartnerships

funding

ICORD is immensely grateful for the continued inspiration, leadership and funding provided by **Rick Hansen** and the **Rick Hansen Foundation**.



Endowments by the Rick Hansen Foundation to the University of British Columbia support salaries for UBC faculty who are key members of ICORD. These endowed chairs, along with fundraising efforts by RHF, help leverage larger investments in research. In the 2012-2013 fiscal year, RHF provided \$800,000 to ICORD. This funding helped the research support team facilitate national and international research collaborations, supported the training of the next generation of SCI researchers, enabled the sharing of core facilities, research equipment and shared research spaces at BSCC, and assisted in communicating research findings to the public.

In April, 2013, the new **Blusson Integrated Cures Partnership** was announced by Rick Hansen. \$2 million per year for 10 years has been promised to strengthen and grow the collaborative partnership between ICORD and the Rick Hansen Institute to provide support and leadership to the international efforts to identify cures for people with SCI.

research

Many of ICORD's Principal Investigators and Investigators have academic appointments with UBC departments, but a number of researchers are based at other institutions. ICORD sincerely appreciates the support provided to its researchers by:



**University
of Victoria**



A fruitful partnership with the **Rick Hansen Institute (RHI)** continues to benefit both RHI and ICORD. RHI supports ICORD research in many different ways, from providing expertise on clinical trials and grants for research projects to funding the following ICORD initiatives in 2012-13: Trainee Travel Awards (27 students funded), Seminar Series (see p.5), Trainee Symposium (see p.6), and International Exchange program (see p.5).

ICORD researchers support RHI by providing valuable input to RHI projects (such as CAMPER: The Canadian Multicentre CSF Pressure Monitoring and Biomarker Study led by Dr. Brian Kwon), and



**Rick Hansen Institute
Institut Rick Hansen**

participating in RHI researcher networks and collaborative initiatives (such as **Interdependence 2012: The Global SCI Conference**). With the Blusson Integrated Cures Partnership in place, both organizations look forward to working more closely with each other to pursue several new avenues of collaboration.

community

Our partnership with **Spinal Cord Injury BC** continues to be rewarding for both organizations. According to Dr. Chris McBride, the Executive Director of SCI BC, "access to the latest information about and participation in SCI research remains a high priority for British Columbians with SCI and Spinal Cord Injury BC alike. Thus, we are incredibly privileged to have the opportunity to collaborate and partner with ICORD, which is not only one of the world's premier SCI research centres, but which also understands and values the importance of its relationship with the SCI community. SCI BC and its members have and will continue to benefit from our symbiotic relationship with ICORD, a relationship that will continue to advance the field of SCI research and the resulting improvements to the independence and quality of life of persons with SCI in BC and beyond."

Our other community partners include the **Tetra Society**, **BC Wheelchair Sports**, **Vancouver Cantata Singers** and **Sam Sullivan Disability Foundation**.

spinalchordgala



Now heading into its fifth year, the **Spinal Chord Gala** supports research and education in spinal cord injury and the arts. This unique partnership between ICORD and Vancouver Cantata Singers celebrates interdisciplinary collaboration between art and science in the community while raising awareness and funding for ICORD's leading-edge SCI research and education and for the VCS.

The generous support of our many sponsors was crucial to making *Spinal Chord 2012* a success. In 2012, event attendance reached over 275, helping *Spinal Chord 2012* to raise \$52,600.

At ICORD, funds raised from *Spinal Chord 2012* were used to support the Community Resource Centre, an educational hub located in the Blusson Spinal Cord Centre established to increase awareness, provide education and offer community resources on SCI to ICORD's visitors. Additional funds were used to acknowledge excellence in research and service among staff through the *Spinal Chord Awards for Excellence in Research and Service*, and to fund the Physical Activity Research Centre (PARC) through a new granting initiative for community-focused research projects led by ICORD faculty members.

Sincere thanks to our 2012 event sponsors

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Thank you for reading our 2012-13 Annual Report.

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Design + layout: Cheryl Niamath.

Printing: EastVan Graphics.

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