16th ANNUAL

TATOR-TURNBULL
Spinal Cord Injury Symposium

DALTON DIETRICH PhD
Scientific Director at The Miami Project to Cure Paralysis
Visiting Keynote Speaker

MICHAEL FEHLINGS MD PhD
Halbert Chair in Neural Repair & Regeneration
Head of Spinal Program, UHN and Vice Chair Research, Dept of Surgery, U of T
Local Host

ALBERT YEE MD MSc
Marvin Tile Chair in Orthopaedic Surgery
Co-Host (UofT Spine Program)

FRIDAY, NOVEMBER 3rd, 2017
12.00 – 6.00 PM
Faculty Club, University of Toronto
41 Willcocks St, Toronto, ON M5S 3G3
We are delighted to welcome you to the 16th Annual Tator-Turnbull Spinal Cord Injury Symposium. This event aims to bring information about cutting edge spinal cord injury research to the wide community of those interested in the area, with special attention to including those living with spinal cord injury and their friends and families.

After being shot at the age of 18 during a convenience store robbery which left her paralyzed from the neck down, Barbara Turnbull went on to become a journalist and a tireless advocate and research activist for those living with spinal cord injury.

Dr. Charles Tator, who treated Barbara after when she came into the ER after the shooting has a legacy which includes establishing the first dedicated spinal cord injury unit in Ontario, providing excellence in the care of individuals with spinal cord injury, directing an internationally acclaimed basic and clinical research program in this field, leading efforts at preventing brain and spinal injuries and also as a teacher and mentor to countless neurosurgeons and researchers.

Dr. Michael Fehlings hosts and organizes The Charles H. Tator- Barbara Turnbull Spinal Cord Injury Symposium each year to honour Charles Tator and Barbara Turnbull, who shared a special doctor-patient friendship, for their enormous contribution, energy and drive in the area of spinal cord injury research.
12.00  REGISTRATION / COFFEE

12.30  WELCOME REMARKS
   Michael Fehlings, Head, Spinal Program, UHN & Vice Chair Research, Dept Surgery, U of T
   Albert Yee, Co-Director, Spine Program, University of Toronto
   Zhong-Ping Feng, Director, Collaborative Program in Neuroscience, University of Toronto

12.40  Ontario Neurotrauma Foundation and Spinal Cord Injury Ontario
   Mr. Kent Basset Spiers, CEO, Ontario Neurotrauma Foundation
   Dr. Stuart Howe; CEO, Spinal Cord Injury Ontario

12.45  The Nature of neural progenitors: how neurons and glia are made from stem cells
   Derek van der Kooy, PhD, University of Toronto

13.00  Engineering tissue repair in models of spinal cord injury
   Molly Shoichet, PhD, University of Toronto

13.15  Activating neural stem cells: It's all about the neighbours
   Cindi Morshead, PhD, University of Toronto

13.30  A Solution for cell therapy safety: paving the way to the clinic
   Andras Nagy, PhD, University of Toronto

13.45  Bioengineered neural stem cells to enhance repair and regeneration of the injured spinal cord
   Michael Fehlings, MD, PhD, FRCSC, FACS, University Health Network & U of T

14.00  Targeting inhibition after SCI to enhance repair
   Andrea Mothe, PhD, Toronto Western Research Institute

14.15  DISCUSSION SESSION 1

14.30  B R E A K
1445  GRASSP - The next generation
Sukhvinder Kalsi-Ryan PT, PhD, University Health Network & University of Toronto

15.00  The science behind bost analysis in the management of spinal cord trauma
Julio Furlan, MD, LLB, MBA, MSc, PhD, FRCPC University Health Network & University of Toronto

15.15  A randomized clinical trial evaluating FES-T walking among patients with chronic motor incomplete SCI: Bone Biomarkers (NCT – 00201968)
Cathy Craven, PhD, University Health Network & University of Toronto

15.30  Garments for functional electrical stimulation
Milos Popovic, PhD, University Health Network & University of Toronto

15:45  The ageing face of spinal trauma: exploring the epidemiology & impact of spinal cord injury in the elderly
Jefferson Wilson, MD, PhD, St. Michael’s Hospital & U of T

16:00  DISCUSSION SESSION 2

16.10  B R E A K

16.20  TATOR-TURNBULL SYMPOSIUM KEYNOTE ADDRESS / CPIN DISTINGUISHED LECTURE:
Translational studies for spinal cord injury: current and future challenges
W. Dalton Dietrich, Ph.D. The Miami Project to Cure Paralysis, Miami, Florida, USA.

16.50  TRIBUTE TO BARBARA TURNBULL
Charles Tator, CM, MD, PhD, FRCSC, FACS, University Health Network & University of Toronto
Michael Fehlings, Head, Spinal Program, UHN & Vice Chair Research, Dept Surgery, U of T
Barbara Turnbull Family members

16.55  CLOSING REMARKS
Michael Fehlings, MD, PhD, FRCSC, FACS, Head, Spinal Program, UHN & Vice Chair Research, Dept Surgery, Co-Director Spine Program, University of Toronto

17.00 to 18.00  WINE & CHEESE RECEPTION & POSTER VIEWING
W. Dalton Dietrich Ph.D. is Scientific Director at The Miami Project to Cure Paralysis at the University of Miami Miller School of Medicine. He received his Ph.D. in Anatomy from the Medical College of Virginia in 1979 and completed a postdoctoral fellowship in the Department of Pharmacology at Washington University, St. Louis, MO, 1981. Dr. Dietrich accepted the position of Scientific Director of The Miami Project to Cure Paralysis in 1997 and is currently Professor of Neurosurgery, Neurology, Biomedical Engineering and Cell Biology. Research in Dr. Dietrich’s laboratory is focused on clarifying the pathophysiology of brain and spinal cord injury with the ultimate goal of developing new therapies to protect and enhance recovery of function. Dr. Dietrich serves on study sections for NIH, Department of Defense, Veteran’s Administration, and several editorial boards. He is currently Editor-In-Chief of the Journal Therapeutic Hypothermia & Temperature Management and Deputy Editor of the Journal of Neurotrauma.

Kent Bassett-Spiers serves as the Chief Executive Officer of the Ontario Neurotrauma Foundation, a position he has held since 1999. Kent has extensive experience in developing strategic linkages and partnerships, organizational restructuring and working with the Ministry of Health on policy and system reforms. He has served health care organizations in a senior management capacity as General Manager - Central Canada, Canadian Red Cross/Canadian Blood Services, Senior Vice President, Chief Operating Officer Doctors Hospital and Vice President (Hospital Services) Toronto Western and Assistant Vice President Toronto Hospital. Kent was the volunteer Chair of the Anne Johnston Health Centre, Vice Chair of the provincial Community Health Center Accreditation Board and is currently a member of the Sheela Basrur Center Advisory Council.

Through his work with the Ontario Neurotrauma Foundation Kent has been involved in a number of partnership activities with the Rick Hansen Foundation and the Rick Hansen Institute including the SCI Solutions Network, Canadian Neurotrauma Research Partnership and more recently with the Best Practices Implementation Project where ONF is taking the lead. Kent is also Chair of the Ontario Working Group of Neurological Health Charities Canada and is a member of Spinal Cord Injury Ontario’s Board of Directors.
Stuart Howe is the Chief Executive Officer of Spinal Cord Injury Ontario - a charitable organization that is an ongoing, life-long resource for people with spinal cord injuries, their families, friends and the professionals in their service. Stuart applies his proven track record in fostering innovation, building partnerships, growing revenues and running operations, to ensure the organization’s success.

Throughout his career, Stuart has continuously challenged the established norms of not-for-profit business practices, and has successfully translated innovations into commercial products. Through his work, he has built robust business partnerships. He has launched new technology companies and service businesses. In doing so, he has become skilled at securing research and development funding, implementing LEAN process improvements, and growing new, sustainable, revenue streams.

Stuart has a Ph.D. in Chemistry from the University of Essex and is a registered patent agent. He has worked for one of Canada’s largest national law firms and spent 16 years in various business roles at Canada’s premier children’s hospital. He has consulted on innovation and business development for a number of hospitals and community service providers, and has served as a director and officer of several for-profit and not-for-profit organizations.

Molly Shoichet Professor Molly Shoichet holds the Tier 1 Canada Research Chair in Tissue Engineering at the University of Toronto. She has published over 575 papers, patents and abstracts and has given over 350 lectures worldwide. She currently leads a laboratory of 32 and has graduated 157 researchers. Her research is focused on drug and cell delivery strategies in the central nervous system (brain, spinal cord, retina) and 3D hydrogel culture systems to model cancer. Dr. Shoichet co-founded three spin-off companies, is actively engaged in translational research and science outreach. Dr. Shoichet is the recipient of many prestigious distinctions and the only person to be a Fellow of Canada’s 3 National Academies of: Sciences of the Royal Society of Canada, Engineering, and Health Sciences. Dr. Shoichet was the L’Oreal-UNESCO For Women in Science Laureate for North America in 2015, elected Foreign Member of the US National Academy of Engineering in 2016, and won the Killam Prize in Engineering in 2017. She holds the Order of Ontario, Ontario’s highest honour, and the QEII Diamond Jubilee Award. In 2014, Dr. Shoichet was given the University of Toronto’s highest distinction, University Professor, a distinction held by less than 2% of the faculty. Dr. Shoichet currently serves as an Associate Editor of Biomacromolecules in addition to serving on the editorial board of several other journals. Dr. Shoichet received her SB from the Massachusetts Institute of Technology (1987)) and her PhD from the University of Massachusetts, Amherst in Polymer Science and Engineering ((1992).
Derek van der Kooy served as Professor in the Department of Anatomy and Cell Biology at the University of Toronto from 1991 until 2002, and then became a Professor in the Department of Molecular Genetics. Derek received a M.Sc. in Psychology at the University of British Columbia, and a Ph.D in Anatomy, first at Erasmus University in the Netherlands, and finishing in the Department of Anatomy at the University of Toronto. Derek gained postdoctoral research experience at Cambridge University in England and at the Salk Institute in California. Derek received the Distinguished Scientist award from the 'Canadian Institutes of Health Research'.

Cindi Morshead did her PhD at the University of Toronto and joined the Department of Surgery in 2003. She is currently a tenured Professor and Chair of the Division of Anatomy, Department of Surgery. Dr. Morshead’s expertise is in stem cell biology and specifically, in the field of adult neural stem cells. Her lab is interested in exploring fundamental questions regarding the behaviour and characterization of neural stem cells and applying this knowledge to regenerative medicine strategies. Her team is actively pursuing the role of endogenous stem cells in models of neurodegenerative disease such as stroke, cerebral palsy, acquired brain injury and spinal cord injury.
Michael Fehlings  After receiving his MD degree from the University of Toronto in 1983, Dr. Fehlings completed his general surgical and neurosurgical training at Queen’s University. Upon returning to the University of Toronto, he completed his PhD and was elected as a Fellow of the Royal College of Surgeons of Canada. He is currently Professor and Vice Chair in the Department of Surgery at the University of Toronto, a McLaughlin Scholar in Molecular Medicine, Senior Scientist at the McEwen Centre for Regenerative Medicine, Co-Director of the University of Toronto Spine Program and Gerald and Tootsie Halbert Chair in Neural Repair and Regeneration. Dr. Fehlings combines an active clinical practice in complex spinal surgery with a translationally oriented research program focused on discovering novel treatments for the injured brain and spinal cord. Preclinically, Dr. Fehlings’ team of researchers are examining the application of stem cells, nanotechnology and tissue engineering for central nervous system repair and regeneration. Clinically, his lab’s research is focused on diagnostic MR imaging techniques, neuroprotective methods and better understanding the natural history of degenerative cervical myelopathy.

Dr. Fehlings recently led an international team to develop clinical practice guidelines for degenerative cervical myelopathy and traumatic spinal cord injury. Dr. Fehlings has received numerous awards including the Gold Medal in Surgery from the Royal College of Physicians and Surgeons, the Lister Award in Surgical Research, the Leon Wiltse Award from the North American Spine Society for excellence in leadership and/or clinical research in spine care, the Reeve-Irvine Research Medal in SCI, and the Golden Axon Leadership Award. In 2013, Dr. Fehlings was honoured with the Queen Elizabeth II Diamond Jubilee Medal presented to him by the Honourable Stephen Harper. In 2014, Dr. Fehlings was elected to the Fellowship of the Royal Society of Canada and to the Canadian Academy of Health Sciences. He was awarded the Regional Mentor of the Year award in 2016 from the Royal College of Physicians and Surgeons of Canada for his significant impact on the career development of medical residents and fellows. In 2017, he was awarded the Dave Lostchuck People’s Choice Award for outstanding SCI Scientist. He is a Deputy-Editor of the journal Spine, Past President of the Cervical Spine Research Society, immediate Past Chair of AOSpine North America, a past AO Foundation Trustee, and Past Chairman of the Section on Neurotrauma and Critical Care of the AANS/CNS.

Andrea Mothe  Dr Mothe is a neuroscientist in the laboratory of Dr Charles Tator. She received her PhD in developmental neurobiology from the University of Toronto and postdoctoral training in spinal cord injury at the Toronto Western Research Institute. She was the recipient of several awards including fellowships from the Canadian Institutes of Health Research and the Ontario Neurotrauma Foundation. Andrea has investigated neural stem cell therapy for spinal cord injury and bioengineering approaches to direct differentiation and promote graft survival. Notably this team first showed that neural stem cells exist in the adult human spinal cord. Andrea is currently examining therapeutic strategies to reduce inhibitory signals after spinal cord injury to promote repair.
Andras Nagy is currently a Shawn Kimel Senior Scientist at the Lunenfeld-Tanenbaum Research Institute, Sinai Health System, Professor in the Department of Obstetrics & Gynaecology and Institute of Medical Science at the University of Toronto, Investigator at the McEwen Centre for Regenerative Medicine and Professor at the Monash University, Melbourne. He holds a Tier I Canada Research Chair in Stem Cells and Regeneration. He also has a Fellowship of the Royal Society of Canada in the Life Sciences Division of the Academy of Science. Dr. Nagy has made significant breakthroughs in the development of mouse and human pluripotent stem cells (both embryonic and induced) that could accelerate research in regenerative medicine and lead to future therapies for currently incurable diseases, such as blindness, diabetes, arthritis, spinal cord injury and many others. His team created the first two Canadian human embryonic stem cell lines and developed a novel method for generating non-viral induced pluripotent stem cells. His current research focuses on understanding the process of reprogramming to stem cells at the molecular level and using sophisticated genome editing methodology to pave the way leading to safe and effective cell based therapies of diseases.

Jefferson Wilson entered the neurosurgery program at University of Toronto after completing his MD at the University of Saskatchewan in 2007. During residency he earned a PhD through IMS and the Surgeon Scientist Program under the mentorship of Michael Fehlings and Abhaya Kulkarni with his research focused on the epidemiology and clinical epidemiology of traumatic spinal cord injury. Jeff’s research has been funded by multiple grants from the Christopher and Dana Reeve Foundation, Cervical Spine Research Society and the Ontario Neurotrauma Foundation; further, he has been the recipient of numerous prestigious awards including: the K.G. McKenzie Prize from the Canadian Federation of Neurological Sciences, the Synthes Spinal Cord Injury Award from the American Association of Neurological Surgeon and the Shafie S. Fazel Outstanding Resident Surgeon and Investigator Award from the U of T Department of Surgery. After obtaining his FRCSC in neurosurgery in 2015, Jeff undertook a combined neurosurgery orthopedic fellowship in complex spine surgery at Thomas Jefferson University in Philadelphia, PA under the mentorship of James Harrop and Alex Vaccaro. Jeff returns to Toronto as a Surgeon Scientist at St. Michael’s Hospital with clinical focus on the full spectrum of spinal disorders. From a research perspective, he is primarily interested in topics related to the epidemiology and clinical epidemiology of spinal trauma and spinal cord injury. Currently he serves as the Deputy Editor of the journal Clinical Spine Surgery.
Julio Furlan is a staff neurologist and a Clinician Investigator in the Division of Physical Medicine and Rehabilitation and the SCI Rehabilitation Program at the Lyndhurst Centre, Toronto Rehabilitation Institute, University Health Network, and an Assistant Professor in the Department of Medicine, Division of Physical Medicine and Rehabilitation, University of Toronto. He completed residency training in Adult Neurology at University of Toronto in June 2014. Most recently he completed a clinical fellowship in Neurorehabilitation and Neural Repair at Toronto Rehabilitation Institute, Sunnybrook Hospital and University of Toronto (2014 to June 2016).

Dr Furlan has extensive training and research expertise. He is a trained head and neck surgeon from Brazil, who holds a MBA degree in Health Administration, an MSc degree in Clinical Epidemiology, and a PhD degree in Neuroanatomy. In the past, Dr. Furlan has worked as an Associate Research Scientist in the Department of Genetics and Development, Toronto Western Research Institute, University Health Network from 2007 to 2012. Dr. Furlan has also been an Adjunct Scientist at Toronto Rehabilitation Institute, University Health Network from 2009-2016, inclusive. Dr Furlan’s research has been focused on outcome measures ((including clinical assessments, neuroimaging analysis, and neurophysiological assessments)) and predictors of outcome ((including sex and age)) after spinal cord injury. In addition he has interest and expertise in secondary complications after spinal cord injury and economic analyses.

Catharine Craven is a Clinician Scientist appointed as an Associate Professor in the Department of Medicine, Division of Physical Medicine and Rehabilitation at the University of Toronto. Dr Craven is a Senior Scientist and Leader of the Neural Engineering and Therapeutics Team and the Medical Lead of the Spinal Cord Rehabilitation Program at Toronto Rehab’s Lyndhurst Centre within University Health Network. Dr Craven’s clinical and research expertise is in the prevention and treatment of secondary health conditions among individuals living with spinal cord injury and their related health service needs. Her recent work has focused on the associations between changes in body composition and multimorbidity (heart disease and fracture) among individuals with chronic spinal cord injury. Dr Craven co-leads the SCI-HIGH project aimed at developing structure, process and outcome indicators to advance SCI rehabilitation in Canada by 2020. Dr Craven is the chair of the 7th National SCI Conference (www.sci2017.com) and holds a Craig H. Nielsen Foundation Senior Scientist Award.
Milos Popovic received his Ph.D. degree in mechanical engineering from the University of Toronto, Canada in 1996, and the Dipl. Electrical Engineer degree from the University of Belgrade, Serbia in 1990.

Dr. Popovic is the Associate Scientific Director at the Toronto Rehabilitation Institute - University Health Network and the Toronto Rehab Chair in Spinal Cord Injury Research. He is also a Professor (Tenured) in the Institute of Biomaterials and Biomedical Engineering at the University of Toronto, as well as Senior Scientist at the Toronto Rehabilitation Institute. Dr. Popovic is also the founder and director of the CentRe for Advancing Neurotechnological Innovation to Application (CRANIA) at the University Health Network and the University of Toronto. He is also the co-founder and director of the Neuromodulation Institute at the University of Toronto.

Dr. Popovic’s fields of expertise are functional electrical stimulation, neuroprostheses, neuro-rehabilitation, neuromodulation, brain machine interfaces, physiological control systems, assistive technology, modeling and control of linear and non-linear dynamic systems, robotics, and signal processing. In 1997, together with Dr. Keller, he received the Swiss National Science Foundation Technology Transfer Award - 1st place. In 2008, Dr. Popovic was awarded the Engineering Medal for Research and Development from the Professional Engineers of Ontario, and Ontario Society of Professional Engineers. In 2011, he was elected to the College of Fellows of the American Institute of Medical and Biological Engineering.

In 2012, company MyndTec Inc., which Dr. Popovic co-founded in 2008, won the 1st Prize and the Best Intellectual Property Award at the annual TiEQuest Business Venture Competition. In 2013, he received the Morris (Mickey) Milner Award for outstanding contributions in the area of Assistive Technologies from the Health Technology Exchange. Also, in 2013, together with Drs. Prodic, Lehn, and Huerta-Olivares, and Mr. Tarulli, Dr. Popovic received the University of Toronto Inventor of the year Award. In 2015, Dr. Popovic received the 2014 University Health Network’s Inventor of the year Award. In 2017, he received the Accessibility Innovation Showcase and Tech Pitch Competition Award at the Ontario Centers of Excellence Discovery 2017 Conference. Dr. Popovic is the co-founder and co-chair of the Canadian National Spinal Cord Injury Conference established in 2004.
Sukhvinder Kalsi-Ryan is a Clinician Scientist in the field of upper limb assessment and recovery and spine pathology at Toronto Rehabilitation Institute, Lyndhurst Centre and is also Assistant Professor at the University of Toronto, Department of Physical Therapy. Her research is oriented to establishing methods to quantify neurological change after injury and studying neuro-restorative methods to enhance and optimize function for those with neurological impairment. She has recently transitioned into a new role at TRI where she is Program Lead of the Rocket Neuro-Restorative Upper Extremity Program. Her role is to build a strong research foundation that will propel the clinic, while enhancing access to care for patients with SCI, and implementing new innovations and technologies. Dr. Kalsi-Ryan provides academic teaching within the Neurosurgical Resident training and Physical Therapy programs at the University of Toronto. She is the founder of her own company, which manufactures the GRASSP; she acts as a consultant for neurological trials worldwide and has recently co-founded the Spine Therapy Network. Her interests include: outcome measurement, upper limb recovery, traumatic and non traumatic SCI, quantification of neurological disorders.
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<th>Year</th>
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<td>2016</td>
<td>Dr. Claes Hultling</td>
<td>Karolinska Institute, Sweden</td>
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<td>2015</td>
<td>Dr. Jan Schwab</td>
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<td>Dr. Ole Kiehn</td>
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<td>Drs. Derek van der Kooy, Cindi Morshead, and Andras Nagy</td>
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<td>Dr. Susan Harkema</td>
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<td>Dr. Armin Curt</td>
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<td>2010</td>
<td>Dr. V. Reggie Edgerton</td>
<td>Brain Research Institute, UCLA</td>
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<td>Dr. James Fawcett</td>
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<td>Dr. Jerry Silver</td>
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<td>Dr. John Steeves</td>
<td>International Collaboration On Repair Discoveries (ICORD), BC</td>
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<td>Prof. Eva Sykova</td>
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<td>Dr. Lars Olson</td>
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<td>Mr. Rick Hansen</td>
<td>Rick Hansen Institute, Vancouver, BC</td>
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"Translational Studies for Spinal Cord Injury: Current and Future Challenges"
Thank you!

The UHN Krembil Neuroscience Centre would like to thank The University of Toronto Spine Program, The U of T Collaborative Program in Neuroscience, Ontario Neurotrauma Foundation, and Spinal Cord Injury Ontario for their generous contribution to the 16th Annual Tator-Turnbull Spinal Cord Injury Symposium

Organizer:

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