EMERGING RESEARCH LEADERS

In the dozen years that Terry Falconer spent as vice-president of administration at the U of M, he devoted countless hours to mentoring academics and researchers and helping them hone their talents and skills. He would be immensely proud of the seven recipients of the 2016 Terry G. Falconer Memorial 12th Institute Foundation Emerging Researcher Awards, an award that was renamed in his memory after his passing in 2015.

**Applied Sciences**

Puyan Mojabi

Electrical and computer engineer Puyan Mojabi is advancing the development of electromagnetic inversion, a process that uses external electromagnetic field observations to locate internal properties in a particular domain of interest. What does that mean? It means that his research can lead to improved microwave imaging and remote sensing that will, in turn, result in enhanced breast tissue imaging, oil exploration, antenna design, and numerous other advances.

**Health Sciences**

Kathryn Sibley

In her determination to enhance patient outcomes by improving communication between researchers and health practitioners, Kathryn Sibley has developed what she calls an integrated knowledge translation research approach. Using this approach, the assistant professor in community health sciences identifies research gaps and subsequently creates, tests and implements different means of closing those gaps.

**Interdisciplinary**

Ji Hyun Ko

An assistant professor in the department of human anatomy and cell science, Ji Hyun Ko is employing his aptitude for both engineering and mathematics to create new functional brain imaging methods. These methods will make it possible to better explore, understand, diagnose, treat and monitor brain abnormalities in neurological and psychiatric disorders such as Parkinson's disease, Alzheimer's disease and post-traumatic stress disorders.

**Humanities**

Etienne-Marie Lass

How do people view themselves, experience life and relate to other humans, environment and culture? These are some of the questions that fuel associate professor of language Etienne-Marie Lass's research on the identity of Lalo, who has always had a keen interest in people, courted much of his research by reading, watching and studying novels, plays, films and what he likes to refer to as "other imagined realities."

**Health Sciences**

Juliette Mammed

Physician Juliette Mammed is looking for explanations. Why do we live in a matter universe instead of an antimatter one and what exactly are dark energy and dark matter? Delving into the most fundamental properties of matter, she uses high energy, polarized electron beams to scatter electrons, measure nuclear and nucleonic properties, and guide her research to the possibility of discovering some new universal force.

**Interdisciplinary**

Neil Bruce

A computer scientist by training, Neil Bruce borrows from several other sciences, including neuroscience, psychology and chemistry, to better understand how people view, sample, and process information. Relying heavily on artificial intelligence, imaging and statistics, he is searching for answers to computer vision problems such as object recognition, scene understanding, and how best to focus attention on certain parts of an image.

**Humanities**

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**Social Sciences**

Chad Lawley

An understanding of the interplay of economics, the environment and agriculture is critically important to Chad Lawley's research. Among many other areas of investigation, the associate professor of agriculture is assessing the pros and cons of gene-emergent invasive species trade measures, supply management in both the dairy and poultry industries, and the dynamic that exists between farmland use, ownership and habitat conservation.

A large part of our goal is to understand the basics of movement so that interventions can be developed that are evidence-based," explains Gardiner, a professor in the university's Faculty of Kinesiology and Recreation Management and department of physiology and pathophysiology, who took over leadership of the SCRC last summer.

"Cell survival, cell regeneration, and cell replacement therapies, including stem cell use, in combination with training and pharmacological activation of specific functional systems, are some of the areas currently being pursued to restore function," he elaborates.

The promise of restored function has been the centre's key motivator since its establishment in 1987, shortly after Rick Hansen's initial visit to Winnipeg during his worldwide fund and awareness raising Man in Motion tour.

"The centre's nucleus of excellence is unparalleled," says Gardiner, whose own research focuses on neural and neuromuscular plasticity.

"Many fundamental discoveries have been generated by our members over the years." Among many others, these include revolutionary findings about the spinal and brain control of urination, the critical role the transmitter serotonin plays in generating movement, the mechanisms by which spinal neurons can adjust their excitability during movement, and the role of electric coupling in controlling sensory transmission."

"I should point out," Gardiner adds, "that many of these discoveries, even those that do not appear to have a rationale for immediate application, can have unforeseen impacts."

Research on the role of different neuron types and circuits in locomotion, for example, are currently being applied to the robotics industry. "The uniqueness of the individual expertise of the SCRC members, who are all internationally known in their field, make the SCRC at U of M highly unique compared to other centers," Gardiner says proudly.

And that uniqueness, of course, holds tremendous promise for everyone affected by such constrained by spinal cord damage.