Bringing Research to LIFE

Upcoming Events

Helping parents understand & help their anxious child or teenager

Roughly one in 10 kids and teenagers experience a problem with anxiety, causing significant distress and interfering with school, and activities with friends and family. These young people are also more likely to have anxiety and mood problems as adults. Learn about the latest in anxiety management: new technological tools and 'listening' strategies designed to help all who are affected, from children to parents.

September 17, 2013 - 7:00 p.m.

McNally Robinson Booksellers, 1120 Grant Ave.

Experts:

Dr. Leanne Mak
Clinical Health Psychology, University of Manitoba & Manitoba Adolescent Treatment Centre

Dr. John Walker
Clinical Health Psychology, University of Manitoba & St-Boniface Hospital

Dr. Roberta Woodgate
CIHR Applied Chair in Reproductive, Child & Youth Health Services & Policy Research, University of Manitoba, Manitoba Institute of Child Health & St-Boniface Hospital Research

Moderator:

Dr. Carolyn Peters
Director of Alternative Solutions, Therapy Services, Agency Training and Evaluation, New Directions

To assist in planning seating RSVP to: Research_Communications@umanitoba.ca or 204-474-6689

For more information on Café Scientifique go to: umanitoba.ca/cafescientifique

ResearchLIFE

The summer 2013 issue is out!

Profs. Elissavet Kardami and Peter Cattini, a couple who work in similar research fields and collaborate regularly, get to the "Heart of the Matter" in the cover feature. This exciting issue has several features on couples and their research life on campus.

Check it out online at researchlife.ca or pick up a copy in ResearchLIFE bins around campus.

How tiny cells influence the big picture

Researcher investigates sub-cellular function

Photo by Mike Latschislaw

Prof. Jason Treberg, Canada Research Chair in Environmental Dynamics and Metabolism

BY KATIE CHALMERS-BROOKS
For The Bulletin

When Jason Treberg reels in a big one he thinks small, right down to the sub-cellular level. He wonders: how well are the fish's microscopic mitochondria functioning and what kind of external factors might be playing a role?

His biochemist side will surface even on fishing trips with friends, admits Treberg, who grew up angling in small-town Paisley, Ont. "I notice the water temperature, whether they're well fed—I can't help but do it," he says.

A Canada Research Chair in Environmental Dynamics and Metabolism, Treberg investigates the behaviour of mitochondria and how these small compartments within a cell transform energy and chemicals from food into something useable. Not only are they involved in metabolism, they affect how quickly our tissues—like muscle—can do the activities we demand of them. In humans, their function has been connected to diabetes, liver disease, cancers and aging-related diseases.

The biological sciences assistant professor is exploring the mechanics of these structures in animals including mammals and fish (mostly rainbow trout and carp) to see how changes at this small scale will alter tissue function. His work could further research into both fish conservation and human disease.

"Fighting off disease, growth, even just maintaining healthy cells, these are all energy-requiring processes and most of the supply for that is coming from the mitochondria in animal cells," he says. "So if the mitochondria are not up to the job because they are not functioning well then that translates to poor functioning cells and can limit how an animal is dealing with poor diet or other external factors that are less than ideal."

For fish, Treberg is most interested in dramatic changes in water temperature. The environment sets a fish's internal temperature, which means their cells change temperature quickly. "We're not quite clear how that change in temperature influences things like mitochondria function and dysfunction," Treberg says.

His work on mammals and fish also focuses on reactive oxygen species (ROS), a type of molecule produced by mitochondria that, when under stress, can damage cells and the organs they form. Other researchers are exploring whether or not tweaks can be done to minimize the effects from ROS to prevent disease .

"There's no cut and dry answer," Treberg says. "Right now, we're really trying to work at the nuts and bolts-level of how mitochondria function, at a mechanistic level so we can have a better sense of putting oxidative stress in context."

He wants to know if mitochondria are producing too much ROS or if they're not consuming enough. Treberg is looking to better understand which process is dominant and under what conditions. Scientists have known for decades that mitochondria are involved with this oxidative stress. "But the sort of mechanistic level we're working at now is certainly beyond what they could do at the time," says Treberg, who came to the U of M two years ago. "New technologies have been of immense help and it continues to advance, so the ability to access small-scale function is continuing to improve. And it's been a huge advantage."

His most significant finding to date has been the discovery that particular mitochondria have a far greater capacity to consume particular ROS relative to their ability to produce them. This suggests mitochondria may be important in keeping levels of ROS low and failure in that role could cause problems for cells. That's "an important change in perspective," Treberg notes.

He had his own change in perspective years ago as a student, switching gears from marine biology to study chemical processes after working with a biochemist that shared an interest in sharks. The basics of how biology works at the sub-cellular level captured his imagination.

Treberg was fascinated by how things happening on a small scale influenced the big picture, including how animals fuel and survive migration or how well they grow. "It was quite striking to realize that."

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