

Bringing Research to LIFE

In brief

Nearly \$10 million in new funding

Faculty and students at the University of Manitoba will receive a total of \$9,593,545 in new scholarships and grants from the Natural Sciences and Engineering Research Council of Canada (NSERC).

The new funding is the result of NSERC's grants and scholarships competition. It includes NSERC Discovery Grants totaling \$8,940,745 for University of Manitoba researchers, and 48 awards totaling \$1,652,800 for young researchers at the graduate, doctoral and post-doctoral levels.

Minister of Industry Tony Clement announced the funding April 9.

Upcoming Events

International Clinical Trials Day Presentations

Thursday, May 20, 2010

9 a.m. to noon

Samuel N. Cohen Auditorium

St. Boniface Hospital Research
351 Taché Ave.
(and via video link to Theatre B,
Bannatyne Campus)

Free admission but registration is encouraged to secure a spot.

For more information, contact:

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Café Scientifique

What affects women's health? It's complicated!

Monday, April 26, 2010

7:00 p.m.

McNally Robinson, Grant Park

1120 Grant Ave.

Free Admission

For more information:

umanitoba.ca/research/cafe_

Pretty Insect, Ugly Disease

Scientist who developed the world's first genetically modified butterfly zeroes in on colon cancer

BY KATIE CHALMERS-BROOKS

Researcher Jeffrey Marcus refused to sit idle while cancer targeted those closest to him. The deadly disease had killed his mother, claimed his grandfather, launched an assault on his supervisor and even went after his dog.

"This all happened over a period of three or four years and it made me realize that it's all fine and good to study things that I find interesting," Marcus says, "but if I could make a connection between this basic research that I was doing and areas where it could be applied that I could actually have a positive impact on human health, it was really my obligation to explore these avenues. These are real people who are being affected by these terrible illnesses and these are real families who are clutching for any hope that there is any sort of way of curing them."

Butterflies and colon cancer

A PhD student at Duke University at the time, Marcus began looking for ways his research with animals could do more to help humans. A biology buff since he was a kid tending to fish in his dozen or so aquariums, the New York-born researcher was fascinated by the study of genes in fish, fruit flies, and brine shrimp. While delving deeper in search of possible links to various cancers, he realized the genetic pathways in one of the prettiest insects he was examining – the butterfly – were similar to those involved in the development of one of the ugliest diseases affecting people: colon cancer.

The creator of the world's first genetically modified butterfly, Marcus was recruited last fall to the University of Manitoba's Department of Biological Sciences and awarded a Canada Research Chair in Phylogenomics (the study of the evolution of genes and genomes). As Chair he continues his quest to better understand how a butterfly develops the colour of its eye spots, which are the circular markings on its wings.

Mutation in pathway

Marcus examines "what genes are being turned on to produce these different colours." It's a similar mechanism to what happens in the colon of a person who has inherited a genetic predisposition to colon cancer. In butterflies, the signals that tell the cells surrounding the eye spots what colour to be are similar to the signals operating in these patients' colons.

"About 80 per cent of all inherited colon cancers are due to a mutation in this pathway or module, the same module that makes butterfly eye spots," Marcus says.



Submitted Photos

Associate Prof. Jeffrey Marcus from the Faculty of Science studies three species of butterflies imported from Florida, including the common buckeye *Junonia coenia* (inset).

In humans, this mutation causes the pathway's "signal" to be on all the time, resulting in the creation of polyps, which are abnormal growths. These polyps can eventually take over the colon, forcing doctors to remove this part of the digestive system so cancer doesn't spread to the rest of the body.

Changing cellular behaviour

Marcus' goal is to figure out if there is a chemical they can inject that can be used to manipulate the genetic pathways in butterflies, and change how their cells behave. And if so, eventually develop a medication that could do the same for humans who carry the same mutation. Such a drug would keep their cells from proliferating and forming

polyps in the first place, which in turn stops cancer from developing. At the very least, Marcus says, perhaps such a medication could allow people to put off – possibly for decades – having to remove their colon and rely on a colostomy bag.

'Hopeful' for future

"I am hopeful that we are going to have some compounds that are going to be demonstrably useful in affecting these pathways in butterflies in the next year or two. To move from that to an actual human medication is a long long process," Marcus says, noting he figures they are at least 10 years away. "But every good idea has to start somewhere."