UNIVERSITY OF MANITOBA

RESEARCH NEWS

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Canola genomics research receives $600,000

By Frank Nolan, Research Promotion Officer

Canola research at the University of Manitoba received a significant boost on June 28, with the announcement of $600,000 in new funding from the Province of Manitoba.

Announced by Energy, Science and Technology Minister David Chomiak, the new funding will support a genomics research team led by Genyi Li, plant science, which is working to improve canola seed for animal feed applications.

"The University of Manitoba's Faculty of Agricultural and Food Sciences played an important role in the development of canola and rapeseed cultivars and the funding being announced today will ensure that Manitoba researchers continue to play an important role in development of oilseeds for future markets," Chomiak said.

Oilseeds like rapeseed and mustard seed contain natural compounds called glucosinolates, which are also found in vegetables like cabbage, broccoli and cauliflower. By definition, canola contains lower levels of glucosinolates than other Brassica crops, and the University of Manitoba team is using genomics tools to investigate ways to reduce these levels even further.

"There are many kinds of glucosinolates, but we're looking at a specific one, called progoitrin, which can have some undesirable effects when it is present in animal meal in high levels," said Li, who holds the Associate NSERC Industrial Research Chair in High Erucic Acid Rapeseed. "About 60 per cent of canola seed is used for animal meal, because it is a good source of protein, while about 40 per cent is used for its oil. Our research will not affect oil in any way, but by reducing the level of these glucosinolates, we hope to improve its effectiveness even more for animal meal."

Li's team includes fellow plant science department members Rachael Scarth and Peter McVetty, NSERC Senior Industrial Research Chair in High Erucic Acid Rapeseed. They have narrowed their research down to a specific family of genes that is involved in progoitrin production, and their goal is to identify the single gene responsible.

"Once we know the gene, the next step would be to use genomics tools to silence it or knock it out," Li said. "There are different ways we can manipulate the gene pathway or change the gene expression that would result in lower levels of these glucosinolates in the seed."

Photo by Bob Talbot

Genyi Li, plant science, (centre) describes his canola genomics project to Genome Prairie President and CEO Jerome Konecsni (left) and Reno Pontarollo, Chief Scientific Officer for Genome Prairie.

The new funding for Li's research was announced at a special event in the Faculty of Agricultural and Food Sciences that also included the official announcement of a new Winnipeg office for Genome Prairie. A not-for-profit corporation, Genome Prairie works in partnership with Genome Canada to fund and manage large-scale genomics research.

In addition to Li's canola genomics project, Genome Prairie also supports the $28 million North American Conditional Mouse Mutagenesis Project led by Geoff Hicks, biochemistry and medical genetics, and Canada Research Chair in functional genomics. This project is the North American arm of a world-wide effort to characterize every gene in the mouse genome. Since mice and humans are genetically very similar, it will ultimately provide new information about thousands of genetically-based human diseases.

State-of-the-art Nano-Lab set to expand

By Amber Anderson Skrabek, External Communications Coordinator
Faculty of Engineering

The University of Manitoba's Nano-Systems Fabrication Laboratory (NSFL) will soon be expanding, thanks to $1.2 million in new funding from the Canada-Manitoba Economic Partnership Agreement (EPA).

The funding, announced on June 29, will provide for new equipment and improved laboratory infrastructure, and the expansion will give more students and researchers access to new technologies, as well as increased commercialization opportunities made possible by the lab's advanced prototyping capabilities.

Photo by Frank Nolan

Cyrus Shafai, electrical and computer engineering, at the Nano-Systems Fabrication Laboratory.

According to principal researcher Cyrus Shafai, electrical and computer engineering, one can think of the Nano-Systems Lab as a full-service "machine shop" for custom made micro-devices with features ranging from tens of nanometers to several microns in size (about one hundredth the width of a single strand of human hair).

Shafai is a member of the Nano-Systems Group that includes fellow electrical and computer engineering faculty Doug Thomson, Greg Bridges, Derek Oliver and Doug Buchanan, who all use the lab for their own research.

The funding announcement was made in the Faculty of Engineering by Rod Bruinooge, Member of Parliament for Winnipeg South, and Fort Garry MLA Kerri Irvin-Ross. Both agreed that our economy depends on our ability to move new ideas and technologies out of the lab and into the marketplace. Manufacturing, telecommunications, aerospace and life sciences, they said, are just some of the sectors that will benefit from a state-of-the-art nano-fabrication facility in Winnipeg.

The NSFL, established in 2002, is completely self-contained and produces its own purified water and nitrogen gas on-site. All of the "machining" takes place in a clean room that looks like a bio-safety lab with its sealed environment, and researchers and technicians wear gowns, headgear and little booties. This is done to ensure particles of dust, huge in comparison to items being produced, are not brought in from the outside.

The lab has already supported the research of close to 50 University of Manitoba faculty and students, along with researchers from outside industry and organizations. Shafai stresses that the Nano-Systems Fabrication Laboratory is a "common-use university facility" and encourages anyone who can make use of its services to do so.

"Nano-technology is changing manufacturing processes," Shafai said. "It has an enormous potential for a wide array of commercial applications, such as microscopic medical devices, cell phone batteries, or computer chips that could fit through the eye of a needle."

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