

Research News

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Researchers see the forest AND the trees

BY FRANK NOLAN
Research Promotion

Since the early 1990s, University of Manitoba researchers have been part of the Manitoba Model Forest, one of 11 in Canada focused on developing sustainable forest management practices. Located near Pine Falls, the one million hectare research site brought together scientists, industries, local communities and others to find better ways to manage forest resources.

The Model Forest Program was officially ended earlier this year, but the Pine Falls site is now part of a new program announced by the federal government in May 2007. The Forest Communities Program will provide funding to 11 organizations across the country for the next five years, including the one in Manitoba.

University of Manitoba researchers Rick Baydack and David Walker, environment and geography, were both involved in the Manitoba Model Forest, and they helped develop the successful application for the Forest Communities Program. Walker will represent the university on the new organization's board of directors, with Baydack acting as his alternate.

"The focus is on communities, which is something Manitoba has been doing for a long time," Walker said. "The model forest included the participation of local residents, particularly First Nations communities. That will be



David Walker (left) and Rick Baydack, environment and geography, are a part of the new Forest Communities Program.

continued and expanded with the new project, which is really designed to include everyone who depends on forest resources, whether it's wood from the trees, wildlife, or the area as a whole, which is important for things like recreation and tourism."

As with the previous project, the forest communities program will include a significant research component.

"The goal is to establish a

strong, science-based, research-driven program, which is something we were involved in from the start," Baydack said. "Beginning with John Sinclair from the Natural Resources Institute, then me, and now David, there has always been strong representation from the U of M."

Baydack and Walker expect that many of the long-term research projects that began with the Model Forest Program will continue under the

Forest Communities Program. Much of this work is done in collaboration with local First Nations communities, and it incorporates traditional knowledge of the area.

"We have a student finishing up a study on porcupines that not only incorporates Aboriginal knowledge, but was also initiated in partnership with the Aboriginal community," Walker said. "This study has a strong science component, looking at wildlife habitat and so forth, but it also depends on things that local elders can tell us. So it has all of the parts, and I think it's a great example of the kind of research that will be undertaken as this new program moves forward."

Many of the ongoing research projects are focused on solving practical problems faced by forest-dependent communities. For example, one study is examining the effects of human activity on the woodland caribou. Another is investigating whether forests can be cut in ways that emulate forest fires, which are common, natural occurrences in boreal forests.

"The forestry industry and the other stakeholder groups are very aware that both human needs and the needs of other species need to be taken into account," Baydack said. "That's what this program has done from the beginning, and that's the philosophy that the Forest Communities Program will continue to bring forward."

Mizuno puts focus on obesity hormones

BY SEAN MOORE
Research Promotion

Tackling the problems that come with obesity isn't always as simple as eating less and moving more, although that's a fine place to start.

Hormones, obesity researchers are learning, play vital roles in determining a person's fat levels and his or her metabolic rates. This is why Tooru Mizuno, Canada Research Chair in molecular endocrinology of diabetes and metabolic control, is focusing on the relationship these chemicals have with waistlines and fatty livers.

He's investigating ways the brain regulates metabolism, and a major focus of his research is Proopiomelanocortin (POMC), a gene produced by neurons in the hypothalamus, which plays a role in suppressing appetite and regulating metabolism. POMC was discovered almost 30 years ago and has attracted the interest of many over the past ten years. But 20 years ago xenin, a hormone produced by the stomach, was discovered and ignored soon after. Mizuno, however, has been experimenting with it.

"Many hormones produced in the stomach or intestine also regulate metabolism partly through acting in the brain function," Mizuno said. "A hypothesis of ours was that xenin regulates metabolism by acting through the POMC system. We found that wasn't right. Xenin seems to work through the brain but clearly not through the POMC system – it's independent of it."

Mizuno recently found xenin, like some other hormones produced in the gut, reduces food intake by signaling the stomach to retard its food processing powers. This is important because the slower your stomach empties, the slower you are to get hungry again and eat again. But what surprised Mizuno was what xenin was doing.

His lab would inject some mice with certain levels of POMC and others with xenin. The subjects were then put into a special chamber that records oxygen intake and carbon dioxide output – a good indirect indicator of metabolic rates. POMC increased it, but xenin had no effect.

"We were kind of disappointed when we measured the metabolic

parameters because there was no difference. But we looked a little deeper and saw what was going on and we felt great," Mizuno said.

Non-obese mice injected with xenin were burning more fat than usual. Rather than reach for the usual carbohydrate or protein to burn for energy, the mice were using fat as their primary fuel.

This holds implications for the battle against fatty liver disease, which, according to the Canadian Liver Foundation, 75 per cent of Canada's 11 million obese people risk developing.

What's more, in studying obesity, Mizuno has noticed a previously overlooked relationship. His lab found that when they inhibited the POMC system they stimulated an enzyme in the liver that synthesizes lipids. And conversely, when they stimulated POMC in the brain they saw the opposite effect.

This is good news for the globe's ever-plumping population especially when previously slim nations are joining the weight-watching ranks of the western world: half of all Brazilian

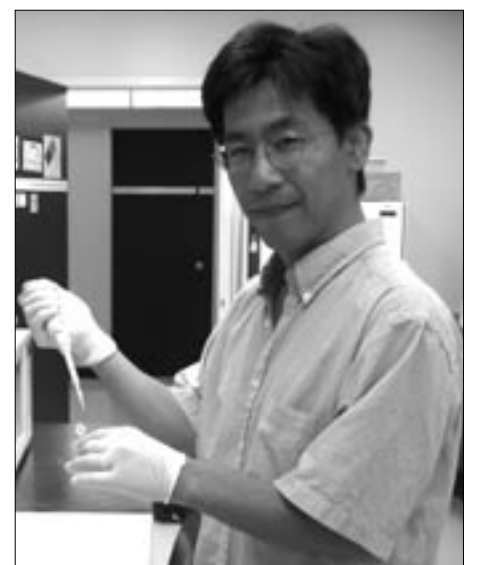


Photo by Sean Moore

Tooru Mizuno, physiology, holds a Canada Research Chair in molecular endocrinology of diabetes and metabolic control.

households have at least one obese person inside, for Russia it's three-quarters of all homes; and more than a fifth of urban Chinese children between the ages of seven and 17 are overweight.

Bringing Research To Life

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