

Bringing Research to LIFE

In Brief

Brockhouse Canada Prize

Two University of Manitoba researchers have won the fourth-annual Brockhouse Canada Prize for Interdisciplinary Research in Science and Engineering.

The recipients are agricultural engineer Digvir S. Jayas, and Noel White, an entomologist with Agriculture and Agri-Food Canada. Dr. Jayas and Dr. White have spent more than two decades studying the causes of grain spoilage, from excess heat and moisture in storage bins, to damage caused by insects, fungi and bacteria.

The Brockhouse award has been given out only four times, and this is the second time University of Manitoba faculty have won it, the previous time being in 2006 when the award was last conferred.

Established by the Natural Science and Engineering Research Council of Canada (NSERC), and named after Nobel laureate Bertram Brockhouse, the prize honours teams of researchers that combine expertise in different disciplines to produce achievements of international scientific or engineering significance, and it includes \$250,000 in funding for future research activities. The winning team was announced by NSERC President Dr. Suzanne Fortier on Feb. 25.

Upcoming

Café Scientifique

Could keeping your kids too clean make them sick?

Wednesday, March 4, 2009

McNally Robinson, Polo Park

1485 Portage Avenue

For more information:

Phone: (204) 474-9020

Speaker Series

Teen Health Talk

By Roberta Woodgate

Wednesday, March 18, 2009

7:00 PM

Robert B. Schultz Lecture Theatre,

St. John's College

For more information:

Phone: (204) 474-9020

Imagination meets intelligence

BY SEAN MOORE

On February 20, the University hosted its third-annual SET Day, assembling over 250 high school students and teachers from across the province and beyond to learn about the future of research.

SET Day – Science, Engineering and Technology Day – is the only event of its kind in Canada. Last year, 100 students from 30 schools came.

This year, 47 Manitoba schools as well as one from Sioux Lookout, Ont., and one from Bellegarde, Sask. participated. The students and teachers heard presentations by leading researchers in five fields: health, climate change, psychology, robotics and biofuels.

"The lectures were more engaging than I was expecting," said Jeff Shaddock, a science teacher at Miles Macdonell Collegiate.

"From speaking with my students and looking at their faces throughout the day, I can honestly say the pros spoke at the appropriate level."

As Shaddock's Grade 12 student Derek Schmidke said: "It was a lot funnier than I thought it would be. Our science classes aren't as humorous."

Indeed, SET Day is meant to show students how appealing science can be.

"The event's goal is to get students excited about present day research and fascinate them with what research we, or I should say they, might be doing twenty-five years from now," said Digvir Jayas, Acting Vice-President (Research) at the University of Manitoba.

The day began with a presentation



Photo by Bob Talbot

Patricia Martens, community health sciences, talks to 250 high school students at SET Day, held Feb. 20.

by Patricia Martens, community health sciences, who described how math permeates all aspects of life. Her lecture was titled, *Mathemagic...The Amazing Power of Math to Help Us Understand Life, Health, and the Universe.*

Then Feiyue Wang, environment and geography, and chemistry, discussed climate change and contaminants in a presentation titled, *WALL-E's Mission, drawing on analogies from the blockbuster movie WALL-E.*

Jason Leboe, psychology, talked about why we forget some things but remember others. His presentation was titled, *Origins of Remembering and Forgetting.*

Shane Yanke, computer sciences, then spoke about the developments in robotics in a presentation titled, *R2D2 and Friends: The Future of Intelligent Robots.*

And the final speaker was Nazim

Cicek, biosystems engineering, who described the past, present, and future of biofuels in his presentation titled, *Biofuels of Today and Tomorrow.*

SET Day was sponsored by the Province of Manitoba (Science, Technology, Energy and Mines), Manitoba Hydro, the Prairies Office of the Natural Sciences and Engineering Research Council of Canada (NSERC), the Association of Professional Engineers and Geoscientists of Manitoba (APEGM), and the Office of the Vice-President (Research) at the University of Manitoba.

The Research Communications & Marketing Unit in the Office of the Vice-President (Research) is currently developing a SET Day website, which will include audio recordings of the day's presentations. Check back soon at: www.umanitoba.ca/research/set

Studying mouthy molecules

BY SEAN MOORE

The way to a person's heart may be through the stomach, but if you want to see how a heart and other systems work at the molecular level, you only have to go as far as the mouth.

February is heart month and oral biologist/biochemist Rajinder Bhullar is investigating the fundamentals of a specific group of proteins that, when they blunder, upset the molecular mechanism that regulate the ability of the heart to pump. In other cases they can lead to the development of cancer.

"I'm an oral biologist, but if you look at a human body, most of the cells are the same no matter where they are located. Unless they are specialized, cells in the mouth do not differ from cells in the toe," he said.

"Our work is trying to understand the fundamental mechanisms in normal and disease conditions. Is a protein missing, or has a protein changed in a way that causes it to activate new pathways that were previously not a part of this protein's job?"

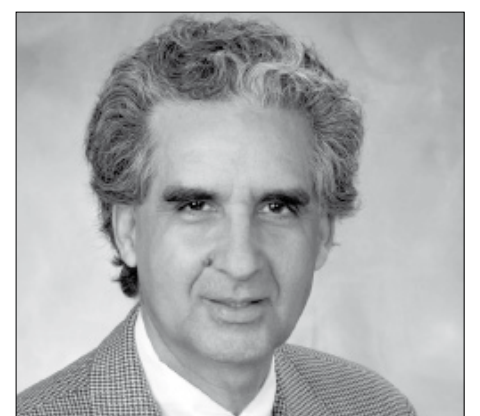
Bhullar is looking at GTP-binding proteins. They are involved in signal transduction, which means when a cell

gives or gets an order to do something, they pass along the instructions to other molecules. Some of these G proteins are found on the cell surface, and others are working within the cell.

This second group is the main subject of study in Bhullar's lab, and of the 200 or so different proteins in this group, Ras p21 receives the most microscope time. This protein regulates cell growth, and when it goes haywire it can cause unmitigated cell growth (cancer). Indeed, about 30 per cent of human cancers are known to be based on mutations in this protein, Bhullar said.

"We have a broad interest in trying to look at the function of these proteins and how they interact with other proteins of the cell, and what impact that interaction has. You can't just say B comes after A. You have to know what the intermediate steps are and what is the physiological impact is of these relationships, and what functions they regulate. That's the most important part, but that is also the most difficult part to establish."

The goal is to develop some small molecules that can potentially be delivered to a specific area within the tissue and – or – cell where they will be able to inhibit or enhance the physiological effect of these protein interactions.



Submitted Photo

Rajinder Bhullar, oral biology/biochemist, is investigating a specific group of proteins implicated in cancer growth and heart troubles.

It's in the early stages, but Bhullar is currently trying to learn more details about how GTP-binding proteins of the Ral family interact with a group of proteins that regulate calcium-mediated pathways. Calcium is important for a variety of functions like muscle contraction in the heart.

"We are doing fundamental work but we are moving towards more end-point results – can we develop some small molecules that can control the function of cells? I hope to."

umanitoba.ca/research

Published by the Research Communications and Marketing Unit, Office of the Vice-President (Research)
Comments, submissions and event listings to: lindsay_fagundes@umanitoba.ca
Phone: (204) 474-9020 Fax (204) 261-0325