

## Federal support fosters research excellence

FEDERAL SUPPORT IS AT THE FOUNDATION OF CANADIAN RESEARCH. IN CANADA, most research is conducted at universities. And the federal government — through its three research granting councils — provides an overwhelming share of the funding for that work. The results of research serve a vital role in the social, economic and physical well-being of Canada. And as society becomes increasingly complex, researchers face even more challenges in their quest to meet the country's changing needs.

Funding from Canada's three major research granting bodies — the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council (NSERC) and the Social Sciences and Humanities Research Council (SSHRC) — promotes and sustains both

The University of Guelph and federal funding councils are responding to a changing research climate.

basic and applied research. The granting council support underpins a wide range of research that encompasses social, economic and technological issues. It's critical for bringing research activity to the classroom, enriching education for undergraduate and graduate students, and training future generations of experts in diverse areas.

At the University of Guelph, tri-council funding has long been the driving force behind innovation and discovery. In 2002/03, U of G received

\$20.1 million from the three granting councils, up from \$13.4 million in 1997/98. More than 300 research teams receive support.

This ongoing commitment demonstrates a belief that investment in research at Canadian universities translates into an investment in the lives of Canadians, a belief shared by the University of Guelph. To strengthen the ties between the University and the granting councils, Guelph has appointed a faculty representative to each organization. Their responsibilities include raising U of G's profile at the councils and relaying information and ideas from the agencies back to the University.

These appointments come at a crucial time as universities across Canada, as well as the councils, are working to respond to a changing research climate.

SSHRC, for example, is considering a restructuring plan designed to make greater use of human sciences knowledge and to encourage enhanced collaboration among researchers and partner institutions.

NSERC is also expanding its scope and recently approved a number of new programs, including ones aimed at increasing math and science literacy and involving community colleges in innovation. U of G and NSERC recently celebrated 25 years of collaboration and formally recognized Guelph faculty who have received 25 years of NSERC funding.

CIHR's unique broad-based approach reflects a growing trend towards innovative research that brings together researchers across disciplinary and geographic boundaries.

CIHR (previously the Medical Research Council) was created in 2000 and comprises 13 institutes, each addressing a health research domain of immediate and identifiable importance to Canadians.



History student Alison Schneider is spending her summer as a research assistant studying crime and punishment in medieval Scotland. Alison's position is sponsored by SSHRC and is one of many undergraduate research assistantships supported by NSERC, SSHRC and CIHR. The goal of this initiative is to spark interest in research, and help students gain valuable experience in the academic world.

# Transforming health care in Canada

*CIHR focuses on advancing the nation's health care network*

SINCE 2000, THE CANADIAN INSTITUTES OF HEALTH Research (CIHR) has been Canada's main health research funding agency. CIHR supports research that enhances knowledge of disease mechanisms, treatment and prevention and health promotion that can be applied to Canada's health-care network. It is committed to generating knowledge and ensuring that knowledge is applied.



## Why boys behave badly

Young boys are injured four times more often than girls are, and U of G researchers say parents could be a contributing factor. Research suggests that parents teach girls to think about risk, but teach boys to tolerate it. Parents may unknowingly encourage sons by simply disciplining unsafe behaviour rather than cautioning them to play carefully, as is typically done with daughters.

## The economics of genetic privacy

Genetic testing could result in higher life insurance premiums, regardless of whether a person's genetic history is accessible to insurers, warns economist Michael Hoy. He says testing potential clients for genes that indicate a predisposition to certain diseases and disorders — such as breast cancer and Huntington's disease — could increase premiums for those at risk. But if testing takes place and results are

concealed from insurers, this could lead high-risk clients to buy more life insurance, which would probably lead to higher claims. Insurance companies, unable to differentiate between low- and high-risk individuals, would be forced to hike up premiums for *all* clients to balance the increased number of claims.

## Bacteria that take out the trash

Bacteria's "taste for waste" is being used to clean up environmental pollutants and chemicals. Researchers are combining bacteria's naturally evolved ability to consume carbon sources with genetic technology to create super bacteria capable of "eating" common chemical compounds. These include harmful pollutants such as benzene and polychlorinated biphenyls (PCBs), which are known to damage human health, wildlife and the environment.



## Mixed signals

Cells in the human body communicate using signalling molecules called hormones. But when these signals get mixed, researchers believe the results can be deadly. Biomedical sciences professor Roger Moorehead is studying the role of hormone signals (the endocrine system) in the formation of breast cancer in genetically susceptible mice. By determining what occurs

before those cells form tumours, he hopes to better understand the cellular-signalling pathways that dictate whether cells live or die. This, in turn, will help in the development of improved cancer therapies and prevention techniques for humans.



## A SCREEN for seniors

Lifestyle and diet influence the health of seniors, so U of G researchers are perfecting an index to help ensure that seniors are not at risk for nutritional problems. The index, called SCREEN (Seniors in the Community: Risk Evaluation for Eating and Nutrition), uses clearly worded questions that help caregivers recognize nutritional inadequacies and make recommendations to improve health.

## Twenty years of cutbacks. Now what?

Twenty years of cutbacks to social programs across Canada may be unduly affecting the welfare of those living in the country's biggest — yet most marginalized — communities. Researchers are looking at programs in vulnerable communities in Montreal, Ottawa, Toronto and Vancouver to see how those involved in the social safety net, including health services and subsidized housing, have changed and what's needed to get them back on track.

## CIHR supports research in these key areas:

- Aboriginal health
- Aging
- Cancer research
- Circulatory and respiratory health
- Gender and health
- Genetics
- Health services and policy research
- Human development, child and youth health
- Infection and immunity

Prof. Mark Baker, Molecular Biology and Genetics, works in his lab with graduate student Ania Ruksc (left) and undergraduate Ashley Birch. Baker is Guelph's rep to the Canadian Institutes of Health Research (CIHR).

- Musculoskeletal health and arthritis
- Neurosciences, mental health and addiction
- Nutrition, metabolism and diabetes
- Population and public health.



# Building understanding and innovation in times of change

*SSHRC promotes ingenuity in diverse disciplines*

THE SOCIAL SCIENCES AND HUMANITIES RESEARCH Council (SSHRC), which has a \$230-million budget base for 2004/05, strives to build Canadian expertise and competitiveness through training opportunities for the next generation of innovative thinkers. Through its programs, SSHRC provides support for research, training and communication activities.



## When autism disorders hit home

Developmental disorders such as autism can cause intense distress in a family, but they're especially hard on parents. Psychology researchers at U of G are studying what makes raising particular autistic children more challenging than others. They're also looking at what support systems are available to relieve family stress. The researchers hope to be able to identify families under the most stress in order to allocate resources that will help them raise their children more effectively and with less hardship.

## The forgotten heroine

A bibliography of Eglantyne Jebb — the British founder of the international Save the Children Fund (SCF) — is in the works. Historian Linda

Mahood is uncovering Jebb's selfless work for the marginalized; she was the first to donate money to people regardless of their race, religion or nationality. Jebb, pictured here, believed all children should have a right to proper living conditions, which is still the SCF goal across the world today.

## School is important for problem kids

Keeping troubled children in school is a challenge, but research shows it could also be the key to reducing juvenile delinquency. U of G professor Jane Sprott says keeping kids in school not only helps their social development, but also lessens their chances of becoming delinquents. She hopes her research will inspire the provincial government to reform the zero-tolerance policy when dealing with delinquency in schools.



## Better reading begins with good coaching

When it comes to learning to read, par-ents

play an important role in the early stages of a child's literacy. But some parents are unsure what coaching strategies work best.

Guelph researchers found that children with a better understanding of the alphabet and its corresponding sounds developed stronger reading skills than those without. This technique, along with the sound-it-out approach, proved successful in teaching children to read.



## What Canadian fathers care about

Fathers across Canada are concerned about positive portrayals of dads in the media, participation in par-ental-leave policies and balancing their family and work responsibilities, say Guelph researchers. They're working with a group of fathers from a variety of backgrounds to understand dads' needs in a project called the Fatherhood Involvement Research Alliance.



History professor Terry Crowley is the U of G's rep to SSHRC.

**SSHRC supports more than 30 social sciences and humanities disciplines in universities across Canada, including:**

- Archeology
- Psychology
- Education
- Economics
- Law
- Fine arts

- Health care
- Environment
- Immigration
- Religion
- Aboriginal rights

**SSHRC-supported positions across Canada:**

- 18,000 full-time faculty
- 12,300 PhD students
- 28,600 master's students
- 2,728 new grants and fellowships awarded

# Investing in people, discovery and innovation for Canadians

*NSERC advances Canada's science and technology capabilities*

THE NATURAL SCIENCES AND ENGINEERING RESEARCH COUNCIL is Canada's largest research granting agency, directing more than \$700 million annually into university research and the training of new scientists and engineers. It promotes excellence in intellectual creativity across Canada and works to provide Canadians with leading-edge knowledge and skills. NSERC funds about 65 per cent of university-based research in natural sciences and engineering.



## A step towards lessening lost pig pregnancies

Researchers have identified the genes that help increase life-giving blood flow to a developing fetus in mice and humans — and now they're zeroing in on pigs. Prof. Anne Croy and her research trainees Gordon Black (middle) and Chandrakant Tayade found that the same kinds of genes that support blood flow in mice and humans are active in pigs, too. Now they're trying to determine the role the genes play in fetal piglet development. The goal is to reduce the abnormally high rate of fetal losses in pigs, which can be more than 20 per cent.

## Blocking light to improve shelf life

Bottled juice left in the sunlight can be robbed of colour and vitamin C by the sun's ultraviolet (UV) rays. That's because clear plastic juice containers are made of polyethylene terephthalate, which doesn't block UV rays effectively. University of Guelph researchers say strengthening these containers with a complementary resin could cut the UV light

degradation rate of vitamin C by as much as half and give consumers a healthier, longer-lasting product.

## NO to Alzheimer's disease

Alzheimer's disease, an increasingly common neurodegenerative disease that often strikes elderly people, looms large for the aging North American population. A Guelph researcher is looking at how nitric oxide (NO), a key molecule that occurs naturally in the human body, interacts with brain cells and what implications it may have for Alzheimer's patients.



## Sound therapy

Listening can be an effective complement to physical therapy for patients suffering from neurological disorders affecting their motor skills, says U of G psychology professor Dan Meegan. He's using auditory stimulation to help with physical rehabilitation. Specifically, Meegan is studying what happens in the brain when the body is being rehabilitated. He hopes to apply his work to help patients affected by

Parkinson's disease, multiple sclerosis and partial paralysis caused by strokes and spinal cord injuries.



## Making water safer

The parasite *Cryptosporidium parvum*, which is commonly found in young dairy cattle and causes diarrhea in both cattle and humans, can contaminate a community's drinking water through field manure runoff. Guelph researchers are looking at how it spreads through herds in an effort to help cattle producers control the infection. By reducing herd infections, producers can take a proactive approach to improving calf health and preventing drinking water contamination in Ontario.



Prof. Peter Pauls, Plant Agriculture, represents the Natural Sciences and Engineering Research Council (NSERC) at the U of G.