

CIHR Achievements in Research

June 2000 - June 2001



CIHR IRSC

Canadian Institutes of
Health Research

Instituts de recherche
en santé du Canada

Canada

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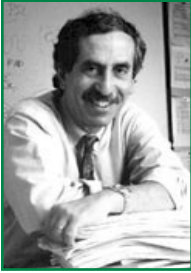
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Dear Parliamentarian:

One year ago, Parliament recognized the importance of a vibrant, internationally competitive and strategic health research initiative. The creation of the Canadian Institutes of Health Research (CIHR) will help realize a vision of health and prosperity for Canadians.



Canadians care deeply about our health care system; it is both a source of national pride and a symbol of national identity. But there is no doubt that our health care system must change, and change profoundly, in order to maintain that pride and identity.

But as surely as we can say our health system must change, so can we assert that, in the coming years, health research will be the major driver of that change. Recent and ongoing advances in our understanding of the human genome, together with our growing appreciation of the complex interplay between genetic, social, and environmental factors that establish our susceptibility to disease, will transform our health care system over the next 10 to 20 years.

By bringing together all four pillars of health research: biomedical, clinical, health services and systems, and population health research, CIHR is taking an integrated approach to the health issues that concern Canadians and creating the knowledge that will transform our health care system and translate into better health for Canadians.

The creation of CIHR positions Canada as a world leader in the international revolution that is making the 21st century “the century of health research”.

Over the past year, we have put in place the structures and the programs that are transforming the Canadian health research enterprise. I am pleased, on behalf of the Governing Council of CIHR, to provide you with this publication, the first in an ongoing series that demonstrates the results that are being achieved with public funding. With your continued support, our successes will help make Canada an international leader in ensuring better health for its citizens, a strengthened health care system, and a growing economy.

A handwritten signature in black ink that reads "Alan Bernstein". The signature is fluid and cursive, with a long horizontal stroke at the end.

Alan Bernstein, PhD, FRSC
President, Canadian Institutes of Health Research



The first year: Laying the foundation

The Canadian Institutes of Health Research was officially launched on June 7, 2000. Since then, CIHR has evolved at a rapid pace, beginning with the identification of 13 institutes on July 25, 2000.

Researchers from across the country, and from across the four pillars of health research – basic biomedical, clinical, health systems and services, and population health research – are supported through 13 “virtual” institutes, linked by their common interest in creating new knowledge and pursuing excellence.

CIHR Institutes

Institute of Aboriginal Peoples' Health

Institute of Aging

Institute of Cancer Research

Institute of Circulatory and Respiratory Health

Institute of Gender and Health

Institute of Genetics

Institute of Health Services and Policy Research

Institute of Human Development, Child and Youth Health

Institute of Infection and Immunity

Institute of Neurosciences, Mental Health, and Addiction

Institute of Musculoskeletal Health and Arthritis

Institute of Nutrition, Metabolism, and Diabetes

Institute of Population and Public Health

CIHR funds more than 5,000 researchers in universities, teaching hospitals, and research institutes across Canada, and supports the training of thousands of outstanding young people in health research every year. CIHR's budget for 2001-2002 is \$477 million. This commitment on the part of the Government of Canada will allow Canada to attract and retain its best and brightest scientists and to remain internationally competitive in today's knowledge-based economy.

In December 2000, 13 internationally recognized researchers were named as Scientific Directors of the institutes, charged with developing strategic research agendas to fulfill each institute's mandate. They are assisted in their tasks by the 218 members of Institute Advisory Boards, representing all areas of the health research community, including researchers, research users, the public and private sectors, voluntary health organizations, and patient groups and individual citizens.

Human Stem Cells: Opportunities and Challenges

CIHR is committed to fostering the discussion of ethical issues and the application of ethical principles to health research. Currently, there are no regulations specifically designed to address stem cell research. Canadian researchers need a legal and ethical framework within which they can explore this growing field of health research, an area that holds tremendous potential for treating many serious diseases.

In the fall of 2000, CIHR convened an international team of researchers and ethicists to discuss both the exciting opportunities and the ethical issues around the use of human embryonic stem cells. In March, 2001, CIHR issued their discussion paper and is seeking feedback on the recommendations as a basis for future policy.

Building Canada's Health Research Community

In January 2001, the results of CIHR's first competition were announced. In total, 478 research projects were approved, ranging from large community-linked and multi-disciplinary health research projects, to investigator-initiated proposals, to multi-centre clinical trials and equipment grants. Thanks to the increased funding provided to CIHR, the size of grants in this competition increased by 20 per cent and the number of grants by 10 per cent — just a first step in CIHR's promise to provide internationally competitive support to researchers right here in Canada. Two months later, in March 2001, CIHR awarded 407 training and salary awards to Canada's outstanding and up-and-coming researchers.

A CIHR Profile in Excellence: Dr. Rémi Quirion



As Scientific Director of the Institute of Neurosciences, Mental Health, and Addiction, Rémi Quirion will lead a national effort to support research to enhance mental

health, neurological health, vision, hearing, and cognitive function, and to reduce the burden of related disorders through prevention strategies, screening, diagnosis, treatment, support systems, and palliation. Dr. Quirion has made the Douglas Hospital Research Centre, affiliated with McGill University, a premier research facility in Canada in the fields of neurosciences and mental health. His research has focused on understanding the relationships between the abnormalities in the brains of people with Alzheimer's, molecular and pharmacological features of neuropeptide receptors and their role in memory, pain, and drug dependence; and models of schizophrenia. Dr. Quirion also takes a major interest in training the next generation of scientists.

CIHR President Alan Bernstein, an internationally known researcher and scientific leader, was awarded the Australia Medal by the Australian Society for Medical Research in June 2001. Dr. Bernstein's pioneering research in the area of cancer, hematopoiesis and gene therapy are landmarks in their field. He has also served as a mentor and role model for young people, and his former students can be found on the faculties of universities and other research institutions throughout Canada, the United States, and Europe.

A year of research achievements

Canadian health researchers have an international reputation for excellence. From François Auger, founder of the Laboratory for Experimental Organogenesis (LOEX) at Laval University, who has grown skin, blood vessels, ligaments, and cartilage in his lab, thereby helping people with severe burns to survive, to the University of Toronto's Martin Yaffe, who has developed a digital mammography machine which gives a clearer image of breast tissue, allowing small tumours and other early signs of cancer to be identified earlier, CIHR-funded investigators have made the research breakthroughs that result in better health outcomes for Canadians.

Today, more than ever, the health problems facing Canadians are complex, and their solutions require a problem-based, interdisciplinary approach. CIHR is investing \$80 million over the next five years to support 29 multi-disciplinary research teams. These teams bring together nearly 600 researchers, representing more than 100 institutions and 242 partners in five countries. Here is just a sample of the research discoveries and new ventures of the past year:

Diabetes and Canada's Aboriginal population

- The University of Alberta reports that 14 people with diabetes who have received islet cell transplants from Ray Rajotte and his team remain insulin-independent, more than a year after the procedure. This truly groundbreaking research, known internationally as the Edmonton Protocol, could replace the daily multiple injections of insulin that people with diabetes now need.
- University of Calgary researcher Ji-Won Yoon and his team of Canadian and Korean researchers use gene therapy to create a new pancreas inside the liver, leading to long-term remission of juvenile diabetes in rats after just one treatment. Their work could spell the end of insulin injections for diabetics.
- Type II (adult onset) diabetes occurs among Aboriginal people in Canada three times more than among the general population, and with a younger

age of onset. Aboriginal ancestry, family history, and lifestyle all contribute to this epidemic. Ann McCauley, of the Kahnawake Centre for Research and Training in Diabetes Prevention, is working with researchers from McGill University and aboriginal communities to expand and evaluate a model for diabetes prevention which is based on community mobilization and incorporating traditions in support of healthy lifestyles of increased physical activity, balanced eating, and maintaining a healthy weight. Research results will be disseminated to Aboriginal communities throughout Canada as well as to policy makers and practitioners to influence their decision making.

- A collaborative interdisciplinary team of researchers from eight universities in three provinces and two other countries, led by T. Kue Young from the University of Manitoba, is assessing how widespread and serious the problem of diabetes in Aboriginal communities is, its likely causes, and the most effective ways to prevent and control the epidemic. Projects will take place in the laboratory, in the clinic, and in the community, and will involve the active participation of Aboriginal organizations and communities.
- Hertzell Gerstein and Salim Yusuf, from McMaster University, are heading the largest clinical trial ever funded by CIHR. The DREAM trial, which involves a team of researchers from across Canada, the United States, and Europe, is testing whether the drugs ramipril or rosiglitazone can prevent type II diabetes. The DREAM trial developed directly out of Dr. Yusuf's internationally recognized HOPE study, which found that ramipril substantially improved the survival rate of patients after heart attacks, and lowered the risk of subsequent attacks, and also reduced self-reported cases of diabetes by 34 per cent. The DREAM trial will pursue these results.

A CIHR Profile in Excellence: Alastair Cribb



A CIHR Scholar and member of the Governing Council of CIHR, Alastair Cribb analyzes drugs at the molecular level to find out why humans and animals experience adverse side effects — anything from skin rashes to fatalities. He and his research team at the University of Prince Edward Island are concentrating on sulfonamides, anti-convulsants, and anti-inflammatory drugs in their attempt to unravel the genetic differences between individuals that influence susceptibility to drug and chemical toxicity.

He looks forward to a day when people hold “genetic credit cards” to let physicians know the safest and most effective drugs for each patient.

Canada's aging population and rural health

- More than half of Canada's rural population is elderly, with high rates of chronic illness — a challenge that is not well addressed by traditional rural health systems. Renée Lyons, of Dalhousie University, is leading a Community Alliance for Health Research to develop a new model for organizing Canadian rural health systems to care for people with chronic health problems. Community-based organizations are working with university-based researchers in establishing an Office for Rural Health in Yarmouth, Nova Scotia. Their approach could improve the quality of life of people with chronic illnesses while reducing the financial and social costs of such illness.
- As Canadians age, they will need integrated, seamless forms of health and social service delivery. An interdisciplinary team of researchers working under the leadership of François Béland, of the Lady Davis Institute for Medical Research at McGill University is examining different models that can treat, manage, and even prevent the medical and social problems of the frail elderly population. Their work could lead to a better quality of life for the elderly, more efficient use of health care services, and, ultimately, to the prevention or delay of factors that cause frailty.
- Every year, thousands of older Canadians die or are hospitalized because of respiratory infections such as pneumonia or influenza. An interdisciplinary team of researchers led by Mark Loeb, of Hamilton's Henderson General Hospital is examining the effect of determinants of health such as socio-economic status, ethnicity, nutrition, air pollution, crowding, immunity, and exposure to tobacco smoke on the risk of older adults developing such infections. Their research could result in the development of individual health promotion strategies, such as immunization, and help health care planners be better prepared for dealing with these infections.
- Fritz Lorscheider and his team at the University of Calgary show how mercury debilitates and destroys parts of nerve cells. They report that brain cells of snails exposed to small amounts of mercury show damage similar to that seen in the brains of humans suffering from Alzheimer's disease. Their findings could provide new clues to the development of Alzheimer's disease.
- Toronto researcher Peter St. George-Hyslop and his team successfully immunize mice against Alzheimer's disease, and show that the drug not only prevents the onset of the disease, but halts its progress after it strikes. A drug to immunize humans could be available within four years if human trials are successful.

Child health and development

- With autism, the earlier treatment starts, the better. About half of all children with autism spectrum disorders (ASD) who receive intense behavioural therapy during their preschool years perform the same as their peers on test scores by school age. Diagnosing ASD is difficult, however, and often doesn't happen until a child is school-aged, when intervention is less effective. An interdisciplinary team of researchers under the leadership of Jeanette Holden, of Queen's University, is attempting to identify genes related to ASD, in the hope that a combination of genetics and early developmental assessments will allow children at risk of developing ASD, because another child in the family has already been diagnosed with autism, to be identified by the time they are six months old. Very high risk infants will be treated to see if this can prevent the development of ASD.
- Achieving optimum health and well-being for children is a complex task, requiring input from many different perspectives. Camil Bouchard, from the Université de Québec à Montréal, is bringing together university researchers, medical experts, public health researchers and promoters, stakeholders, and community researchers in an effort to improve the health and well-being of children living in urban, suburban, and rural communities in the Montreal area, and to provide support for local resources and citizens working in those communities.
- Injuries, many of which are intentional and most of which are preventable, are the leading killer of young people aged 12-19 in both Canada and the United States. But while considerable attention has been given to preventing typical childhood injuries, the same is not true of injuries specific to youth. The Healthy Youth Community Alliance for Health

A CIHR Profile in Excellence: C. May Griffith



As people age, their corneas tend to deteriorate. C. May Griffith is helping people to see again. Dr. Griffith and her team at the University of Ottawa Eye Institute have successfully constructed an artificial cornea, the transparent sheath that covers the eye and protects it from the surrounding environment. While her discovery still needs extensive testing, it could lead to human transplants in the not-too-distant future and could eliminate the need for live animals in testing the toxicity of new drugs and other substances that are potentially irritating to the eye.

A CIHR Profile in Excellence: Patrick Lee



As a highly respected virologist and cancer biologist at the University of Calgary, Patrick Lee has championed the development of reovirus as a potential treatment for cancer. Reovirus, like all viruses, self-propagates and multiplies when it attaches itself to a host cell. With ordinary viruses, they can cause sickness due to infection. Reovirus, though, kills cancerous host cells and leaves healthy cells alone. Using reovirus is a novel approach to treating cancer, and Dr. Lee says he and his team stumbled on it quite accidentally. Human trials of reovirus, in the form of a drug called Reosyn, began in May 2000; if successful, Reosyn could be used to fight malignant breast, lung, and neck tumours.

Research, led by Bonnie Leadbeater of the University of Victoria, is focusing on preventing risks for youth injuries by identifying health risks and by investigating health-promotion strategies designed specially for both normally developing and high-risk youth.

- Young people participating in hockey, whether recreational or competitive, are at risk for head injuries, an issue of growing concern for players, parents, and the volunteer and government organizations that support hockey. David Goodman, of Simon Fraser University, is heading a Community Alliance for Health Research directed at reducing mild head injuries by quantifying how often they occur in youth hockey; developing assessment tools and guidelines for return to play; and developing and implementing prevention programs. Their work will have benefits for the health of all youth hockey players, as well as being applicable to other sporting activities such as rugby, figure skating, and snowboarding.
- Peter Coyte and his colleagues at the University of Toronto find that children hospitalized with ear infections are much less likely to need further surgery if they undergo a two-part procedure that combines the removal of the adenoid glands and the insertion of tubes into the ears than if they just have tube surgery. Their research could save Canada's health care system more than \$300 million each year.
- Jacques Drouin, of the Clinical Research Institute of Montréal (IRCM), discovers a gene that, when mutated, causes a hormone deficiency at birth that results in severe hypoglycemia and death in affected children. Affected children can now be identified by molecular diagnostic techniques and rapidly treated with replacement hormone therapy to ensure their normal development.

Women's health

- Women who carry mutations in one of the two genes known to dramatically increase susceptibility to breast cancer will be able to make more informed choices about prevention and screening, thanks to a project called INHERIT BRCA – the Interdisciplinary Health Research International Team on Breast Cancer. The project brings together a team of 16 researchers from seven institutions in Canada and abroad led by Jacques Simard of Laval University to examine the impact of testing on long-term quality of life, how people comply with screening recommendations, and how they utilize the health care system as a result of the testing. The team is also examining concerns related to the legal and socio-ethical implications of genetic testing, including issues of confidentiality and discrimination, such as access to insurance.
- Throughout their adult lives, women are more likely than men to experience stress and overwork as a result of their multiple care and work responsibilities. Little is known, however, about how this affects their health. Carol Amaratunga, from Dalhousie University, together with the Maritime Centre of Excellence for Women's Health and the Nova Scotia Advisory Committee on the Status of Women, are leading an innovative and collaborative Community Alliance for Health Research to better understand the connections between women's paid and unpaid work and their health. Their work will encourage innovative approaches to how our society structures our work and caregiving roles.

A CIHR Profile in Excellence: Christiane Poulin



Christiane Poulin calls herself a small-town doctor with a good sense of community values. As an associate

professor of epidemiology and community medicine at Dalhousie University, Dr. Poulin is studying substance abuse among youth at four Nova Scotia schools. She wants to reorient drug education to focus on teaching young people about drug risks, thereby reducing their involvement with harmful drugs. As a medical doctor, Dr. Poulin found she couldn't stop teenagers from abusing drugs. As an epidemiologist, she can address drug addiction at its source. She is also investigating the abuse of ritalin among children.

Workplace health and safety

- Working in marine and coastal occupations in Atlantic Canada is notoriously dangerous and risky. Stephen Bornstein, from Memorial

University, is working with partners from government, labour, and industry to examine work in the fisheries and the oil and gas industry, and work that results in exposure to cold air and cold water, to develop a scientific understanding of the causes, treatment, and prevention of workplace accidents in these environments. The research will also provide practical recommendations for innovation in diagnosing and preventing these accidents, establishing regulations and training health professionals, workers, and managers to prevent them.

Battling disease

- Brett Finlay, a CIHR Distinguished Investigator, and his research team at the University of British Columbia develop a vaccine that significantly reduces the levels of the bacteria *E. coli* in cattle. The vaccine is being tested on a large scale across the country this fall; if successful, it could reduce the risk of cattle excrement contaminating water supplies, such as happened in Walkerton, Ontario last summer, and prevent hamburger disease. The research team would like to develop a variant of the vaccine for children.
- Josef Penninger of the Ontario Cancer Institute finds the “off” switch that stops the immune system from attacking the body’s own cells. His team’s research could lead to new ways to fight cancer, diabetes, heart disease, multiple sclerosis, and other disorders.
- A team of Canadian and American researchers, including Johanna Rommens of the Hospital for Sick Children, identify the gene that leads to prostate cancer. While the gene is probably only responsible for about 2-5% of all cases of prostate cancer, the finding is significant because it could provide the key to earlier diagnosis and more appropriate treatment.
- Mickie Bhatia and his colleagues at the J.P. Robarts Institute in London, Ontario, find a way to make adult stem cells reproduce in the laboratory much as they do in a human embryo. Their discovery could make stem cell research easier, leading to new treatments for a multitude of diseases.
- Chris Bleackley of the University of Alberta and his team discover why tumours can avoid destruction by the cells of the immune system that protect the body. Their work could lead to new treatments for breast, liver, and skin cancer, as well as for autoimmune diseases, and could help prevent the body from rejecting transplanted organs.



A CIHR Profile in Excellence: Judes Poirier

McGill University's Judes Poirier was featured on the front page of the Wall Street Journal and named "Neuroscientist of the Year" by Québec Science for his discovery that apolipoprotein E, a protein that transports cholesterol to the brain, is also genetically linked to the most common form of Alzheimer's disease. Dr. Poirier found that 80 per cent of people with sporadic Alzheimer's had low levels of Apo E4, one of the forms in which apolipoprotein exists in the human body. His discovery has made it easier to track people who carry the gene for the most common form of Alzheimer's disease, to better assess their chances of contracting it. He is now testing new drugs that could raise levels of Apo-E in susceptible people. As Dr. Poirier points out, if we could delay the onset of the disease by five years, we would eliminate half the cases.


- Jean-Pierre Julien and his research team at the Montreal General Hospital receive funding to investigate how amyotrophic lateral sclerosis (ALS, or Lou Gehrig's Disease) is linked to abnormal fatty deposits found on nerve cells. The team will try to determine if these toxic deposits occur as a response to cytokines, the immune system's inflammatory cells. If so, Dr. Julien and his team will try to find out how cytokines contribute to motor disease in ALS, a neurodegenerative disorder that affects adults.

Creating synergies through partnerships

The creation of CIHR has sparked momentum to develop a national strategic health research agenda that brings together all partners in the health research process. All levels of government, the voluntary health sector, and the private sector are working together to better respond to the health needs and priorities of Canadians. CIHR partners help to identify research priorities and frame the relevant research questions, and they contribute financially to the answering of these questions, building on the Government of Canada's own investment in health research. CIHR and its partners together invest in excellence and transfer the results of new-found knowledge back to the constituencies that each partner serves.

In the past year, CIHR has developed several innovative partnerships:

- A strategic partnership developed by CIHR's Institute of Circulatory & Respiratory Health and the Heart and Stroke Foundation is addressing priority areas related to heart disease and stroke, the leading causes of death in Canada. This first partnership agreement signed between CIHR and the voluntary sector sets the stage for a series of new and innovative



initiatives in cardiac research, ranging from national training strategies for the future of cardiac research, to speeding the translation of knowledge from discoveries into real techniques and treatments for the benefit of Canadians.

- CIHR's Institute of Health Services and Policy Research and its Institute of Population and Public Health have entered into a partnership with the Canadian Institute for Health Information focused on improving the quality of care in Canadian hospitals. The partnership will fund researchers to determine, through a systematic review of Canadian hospital charts, the extent of health system error (avoidable and otherwise) in Canadian hospitals and the availability of routinely collected data that could serve to monitor and reduce the occurrence of health system error.
- CIHR's Institute of Neurosciences, Mental Health and Addiction has formed a partnership with the Barbara Turnbull Foundation for Spinal Cord Research and the NeuroScience Canada Foundation to support the Barbara Turnbull Award for Spinal Cord Research. The award, which was announced by internationally recognized spinal cord research champion Christopher Reeve, will recognize an outstanding researcher who has contributed to the advancement of world-leading spinal cord research conducted in Canada, and will provide new funding to support such research.
- CIHR, together with its Institute of Cancer Research, is working with the Canadian Cancer Society, the National Cancer Institute of Canada, the Canadian Association of Provincial Cancer Agencies, and Health Canada to develop a Canadian Strategy for Cancer Control. Its ultimate goal is to reduce the burden of cancer on our health system and on society by maximizing the impact of efforts aimed at fighting and preventing cancer through coordinated and collaborative action. Part of the strategy is an effort to prioritize research efforts for the greatest possible impact.

Strategic initiatives:

The CIHR difference lies in making strategic choices and decisions and about taking a directed approach to answer specific questions. Each of CIHR's 13 institutes is charged with developing a strategic research plan that will fill in research gaps and build capacity in its field. Since the Institutes' Scientific Directors were appointed, they have been consulting widely with researchers, research funders, and research users to determine priority areas for Institute Strategic Initiatives. Several Strategic Initiatives are already underway:

- The **CIHR Strategic Training Initiative in Health Research** is focusing on training the next generation of researchers and increasing the capacity of Canada's health research enterprise to address important research questions in all areas of health research. It has been predicted that 100,000 new researchers and scientists will be required by 2010 in Canada alone. There will be fierce international competition for this research talent. Innovation and excellence in the next generation of health research training programs is key to attracting the best and the brightest creative minds to Canadian health research. This historic initiative will be carried out in partnership with the provinces, the voluntary health sector, and industry.
- CIHR's Institute of Neurosciences, Mental Health, and Addiction has developed the innovative **Brain Star**, a biweekly award to recognize the excellence of research done in Canada by graduate students, post-doctoral fellows, and residents. The \$1,000 award is for research articles published in the past six months, and is intended to be used to present the research results at a scientific meeting.
- CIHR's **Institute of Aboriginal Peoples' Health** has developed a strategic initiative to respond to its four research priorities: a survey research centre for Aboriginal health; child and youth health promotion and risk reduction and community wellness and addictions; the influence of stress the diabetes among Aboriginal Canadians; and the prevention of accidents and injuries. Teams of researchers, both academic and community-based, are being asked to pool their expertise, perspectives, and resources to address these important health issues.
- CIHR's **Institute of Cancer Research**, in collaboration with existing cancer organizations and provincial cancer agencies, will fund as many as 10 training centres in cancer research across Canada.

A CIHR Profile in Excellence: Tony Pawson



Tony Pawson, a CIHR Distinguished Investigator and Acting Director of the Samuel Lunenfeld Research Institute of Mount Sinai Hospital in Toronto, is one of the world's leading experts in the new science of proteomics, or how our proteins interact to make our bodies function normally. This research will be the foundation for the development of a whole new generation of 21st century drugs. In addition to receiving virtually all of Canada's highest awards for research, Dr. Pawson has received in the past three years alone the Heineken Prize from the Royal Academy of the Netherlands and the Pezcoller International Award from the American Association for Cancer Research.

Building Canada's New Economy for the 21st Century

CIHR plays an important role in supporting Canada's economic prosperity in the 21st century:

- CIHR research helps to ensure that the best health care practices are put in place, saving resources that would otherwise be expended on ineffective or less effective practices.
- CIHR research leads to cures for diseases like diabetes, that have significant costs for the Canadian economy in terms of health care costs and costs due to lost productivity and early death. The economic burden of diabetes, for instance, is estimated to be as high as \$9 billion each year in health care costs, disability costs, lost work days, and premature death.
- CIHR research contributes to the growth of the new economy through the creation of commercial spin-offs.

Success in the commercial arena depends critically on research and innovation. Academic research is the wellspring that drives the growth and success of the biotechnology sector.

Public investment is critical to the generation of commercial growth. From training the next generation of researchers, to providing competitive levels of funding and providing the required infrastructure support, to placing resources into technology transfer and intellectual property expertise, public investment is the fuel that powers the engine of job creation and growth in the knowledge-intensive economy of the 21st century.

In Canada, CIHR-funded research has resulted in exponential growth in the life sciences. Today, the life sciences account for 86,000 jobs in Canada, a figure that is forecast to grow to more than 130,000 jobs by 2003. Already, there are more than 100 publicly listed Canadian health-related companies with a market value of close to \$15 billion.

Canada's biotechnology sector, the growth sector of the new economy, is the second-largest in the world, in no small part due to CIHR investments. At the University of British Columbia alone, CIHR investments have led to the creation of more than 20 private companies that have created almost 750 jobs for highly

trained Canadian researchers and scientists. Among them is Quadra Logic Technologies, which is developing photofrin, an anti-cancer drug that works by sensitizing cancer cells so that they can be destroyed by a safe form of radiation.

One of the most exciting developments in this area has been the growth of Micrologix Biotech. This Vancouver-based company, also a spin-off from a UBC grant, is testing cationic peptides as a way to prevent infections from catheterization, based on the work of Bob Hancock at the University of British Columbia. Some five million catheters are inserted into patients every year. They can be infected even before they enter the body, and can start infections in the body once inserted. With no similar products available, Micrologix's product is being fast-tracked through clinical trials by the FDA in the United States and is expected to be on the market within the next couple of years. In the meantime, Micrologix has grown from one employee to 40, and its market capitalization of \$300 million is set to rise ten-fold once the product is ready for market.

Across the country, CIHR investments have led to many more significant commercial spin-offs:

- Ottawa's WorldHeart Corporation is developing what is essentially a fully implantable artificial heart;
- Winnipeg's Biovar Life Support has invented devices to help patients undergoing heart bypass surgery;
- DiagnoCure, a Quebec City company, has developed a highly accurate test to detect prostate cancer by spotting a genetic "marker" for the disease in urine.

