



Canadian Institutes
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Instituts de recherche
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Health Research: The key to HIV/AIDS solutions



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Health Research: The key to HIV/AIDS solutions

Over the past 20 years, HIV/AIDS in the western world has been transformed from a disease causing certain death to a chronic condition to be managed over many years – and research has been the key to making it happen.

Today, with new challenges, including the long-term impacts of living with HIV/AIDS for many years as well as the explosion of AIDS in the developing countries of Africa and Asia, research remains the key to finding solutions, both in Canada and internationally.

The Government of Canada, through the [Canadian Institutes of Health Research \(CIHR\)](#), supports Canadian researchers in the biomedical, clinical and social sciences as they seek the advances that help to stop the spread of HIV, develop better treatments (and, ultimately, a cure for AIDS) and improve the quality of life of people living with HIV/AIDS.

The Canadian Strategy on HIV/AIDS and the Canadian Institutes of Health Research: A winning combination

The [Canadian Strategy on HIV/AIDS \(CSHA\)](#) emphasizes the power of collaboration. It brings together all partners, including community organizations, Aboriginal organizations, the private sector, academia, health and social service providers, governments and people living with HIV/AIDS, to develop a coordinated Canadian response.

Research has transformed HIV/AIDS into a chronic, manageable disease and research holds the key to its eventual eradication. CIHR is committed to working with the global community to achieve this goal.

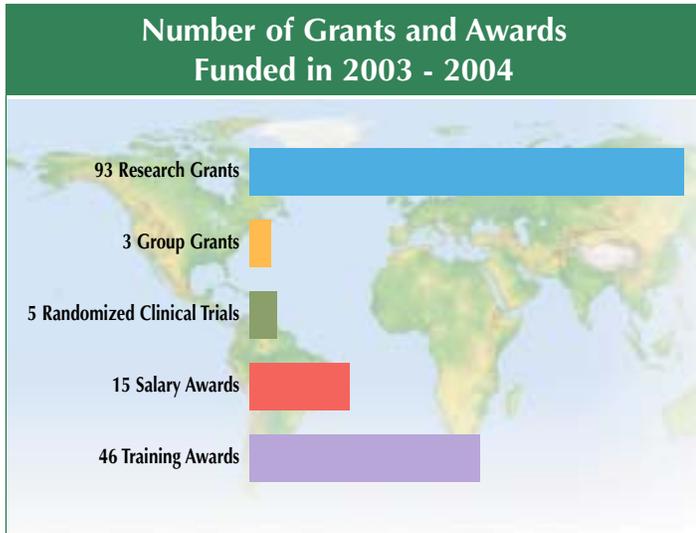
*Dr. Alan Bernstein,
President, CIHR*

Research is an important element of the strategy. CIHR, Canada's premier agency for health research, administered \$10 million on behalf of the CSHA in 2003-2004 to fund excellent research and outstanding researchers across the spectrum of HIV/AIDS research. In addition, CIHR contributed \$8 million from its own operating funds toward HIV/AIDS research. The \$18 million total is an increase of more than \$3 million over the previous year. In addition, \$7 million in CIHR funding went to support research indirectly focused on HIV/AIDS.

Through its Institute of Infection and Immunity, under the leadership of Dr. Bhagirath Singh, CIHR is leading the identification of research priorities and undertaking collaborative research initiatives to reduce the burden of HIV/AIDS domestically and internationally. The Institute has created the CIHR HIV/AIDS Research Advisory Committee (CHARAC) to assist CIHR in



determining research priorities and ensuring that research is relevant and meets identified needs. The committee members represent five CIHR Institutes, Health Canada, the Ministerial Council on HIV/AIDS and the HIV/AIDS research and volunteer communities.



The Canadian HIV Trials Network: A unique Canadian advantage

Canada has a unique advantage in its **Canadian HIV Trials Network (CTN)**. This world-leading partnership brings together clinical investigators, people living with HIV/AIDS, the pharmaceutical industry and community physicians to conduct scientifically sound and ethical clinical trials. It is a flexible and responsive network that both fosters trial development and provides an established infrastructure for the quick implementation of trials – including access to

a wide pool of HIV/AIDS patients for recruitment into studies. Its existence makes Canada an ideal place to conduct pivotal trials.

The knowledge gained from the 63 CTN trials that have been conducted to date has resulted in new and more drugs being prescribed according to CTN guidelines, contributing to a decline in HIV-related morbidity and mortality, as well as to savings to provincial drug plans of at least \$32 million.

- A study led by Drs. Sharon Walmsley of the University Health Network and Sylvie Trottier of Quebec City’s Laval University has found that both nelfinavir and ritonavir as part of highly active antiretroviral therapy (HAART) result in a substantial decline in disease prevention, and that nelfinavir is better tolerated than ritonavir.
- Treatment for HIV infection can start later than originally believed – when CD4 count is as low as 200, instead of 500, as has been the case – according to Canadian researcher Dr. Julio Montaner of the University of British Columbia. His finding means relief from the significant side effects of HIV therapy for patients, and cost savings for the health care system.

Knowledge created through CTN trials has reduced HIV-related morbidity and mortality and saved provincial drug plans at least \$32 million.



Focus on Communities

Rates of HIV/AIDS among Canada's Aboriginal population are on the rise and, compared to their non-Aboriginal counterparts, Aboriginal People are becoming infected at a younger age. CIHR, led by its Institute of Aboriginal Peoples' Health, is supporting research intended to address the HIV/AIDS epidemic in Aboriginal communities, through research intended to better understand, diagnose and treat HIV infection in Aboriginal youth.

A key feature of this research is the involvement of Aboriginal communities and organizations in the design and implementation of research projects. This approach, known as community-based research, provides study populations with control of the research they are involved in and helps to disseminate the knowledge created back to the community to help them in their fight against HIV/AIDS.

Canadians involved in community-based research are making an important contribution toward providing effective services and engaging people affected by HIV/AIDS.

CIHR has recently taken responsibility for the CSHA HIV/AIDS Community-Based Research Program, designed to ensure that communities, through research, have the knowledge to develop appropriate and effective responses to the epidemic. The program provides dedicated funding for Aboriginal and non-Aboriginal communities to conduct and benefit from community-based research.

Canadians Contributing to the Quest for a Vaccine

A vaccine against HIV/AIDS has been the holy grail of researchers throughout the world. In Canada, CIHR has partnered with the [Canadian Network for Vaccines and Immunotherapeutics \(CANVAC\)](#), a federally funded Network of Centres of Excellence, to lead the search for an HIV/AIDS vaccine. CANVAC plays an important role in vaccine development by bringing together leading Canadian scientists specializing in the fields of immunology, virology and molecular biology.

Canadian researchers have been instrumental in identifying populations with natural resistance to HIV and potential mechanisms for protective immunity. For example, Drs. Keith Fowke and Francis Plummer and colleagues from the University of Manitoba have been studying a small minority of female commercial sex workers in Nairobi, Kenya who are repeatedly exposed to HIV but remain uninfected with the virus. At the McGill University Health Centre, Dr. Nicole Bernard and colleagues compared two groups of intravenous drug users who were highly exposed to HIV through needle sharing with partners known to be HIV-positive. One group became HIV-positive after a year of exposure; the other remained HIV-negative. The work of the Manitoba group has led to the development of a vaccine, which is currently being tested in a clinical trial conducted by researchers at Oxford and in Kenya. The findings from the McGill University study support the current trend in HIV vaccine design.

A faint world map is visible in the background of the top half of the page, showing continents in light green and oceans in light blue.

Researchers in Ottawa and Montreal are now leading the first Canadian-led controlled trial of a therapeutic HIV vaccine – one intended to treat those already infected, as opposed to preventing infection in the first place. The trial, lead by Dr. Jonathan Angel of the University of Ottawa, combines products from two companies, both of which have been tested separately and each of which has been shown to be better at inducing one aspect of the immune response.

Reaching Global Communities

HIV/AIDS has become overwhelmingly a disease of the developing world. In some cases, solutions developed in western nations can be adapted to developing countries. In other cases, the unique situation requires new research – research that is beyond the means of many of the countries in crisis.

Through the [Global Health Research Initiative](#), CIHR is helping to support Canadian researchers in working with their counterparts in developing countries and building capacity in the area of HIV/AIDS research. This unique partnership, which brings together CIHR with the International Development Research Centre (IDRC), the Canadian International Development Agency (CIDA) and Health Canada, is funding 13 health research projects on HIV/AIDS.

- Nearly half of the 40 million people in the world infected with HIV/AIDS are women. They, in turn, spread the disease to their children through childbirth and breastfeeding. In a world where saying “no” to unsafe sex may not be an option, a prevention method under the control of women could save millions of lives. Laval University’s Dr. Michel G. Bergeron is testing just such a method – a vaginal gel containing the microbicide sodium lauryl sulfate. With the support of the CIHR Randomized Controlled Trial program, he is testing its safety and acceptability on healthy young African women in Cameroon. If the gel proves effective, a new method of HIV/AIDS prevention may fall under the control of those who need it most.

Exemplifying Excellence

- Reducing the number and severity of side-effects from antiretroviral drugs is key to managing HIV/AIDS over the long term. Dr. Michael Rieder and his colleagues at the University of Western Ontario and Robarts Research Institute in London, Ontario have identified changes in patients’ cells that make the cells more vulnerable to injury and death and may be responsible for producing side effects during treatment. Their research could lead to new ways to reduce negative side effects.
- The Polaris HIV Seroconversion Study, led by Dr. Liviana Calzavara of the University of Toronto, has found that people at risk of HIV become less worried about it the longer they test negative, believing the high-risk behaviour they engage in is safe. The results underscore the need for enhanced counseling for those who repeatedly test negative and continue to engage in high-risk behaviour.
- Aboriginal injection drug users in Vancouver are becoming infected with HIV at twice the rate of non-Aboriginal injection drug users, according to research by Dr. Patricia Spittal of the BC Centre



for Excellence in HIV/AIDS. Her team's finding emphasizes the need for a public health strategy planned and implemented with the Aboriginal community to reduce the harms of injection drug use in the Aboriginal population.

- A drug being tested for use in cancer is showing promise for halting AIDS-related dementia, according to a study by Dr. Chris Power of the University of Calgary. AIDS-related dementia affects 20 per cent of people with AIDS and usually begins seven-to-ten years into the disease – meaning that as survival rates increase, more and more patients will experience the dementia.
- The emergence of drug-resistant variants of HIV has limited the options available for successfully treating AIDS. McGill University's Dr. Mark Wainberg, past president of the International AIDS Society, and his team have found that viruses containing the M184V mutation are slower to replicate, making it less likely that these viruses will be fully virulent. Dr. Wainberg is known internationally for his work in resistance to antiretroviral therapy.

Looking to the Future: An interview with Dr. Bhagirath Singh

Dr. Bhagirath Singh is the Scientific Director of the Institute of Infection and Immunity of the Canadian Institutes of Health Research and a leader in the fields of the immunology of peptides and the regulation of autoimmune diseases. Dr. Singh is currently a Professor in the Department of Microbiology and Immunology at the University of Western Ontario, and a scientist at the Robarts Research Institute.



What are the challenges facing the scientific community with regard to HIV/AIDS research?

We have made significant progress in transforming AIDS into a chronic disease; however there are still many questions we must resolve in order to prevent the spread of the disease. Basic science will continue to be important as we persist in our efforts to find improved treatments and vaccines.

In addition, we have to proceed on the assumption that it will be some time before we can eradicate HIV/AIDS, so a focus on prevention continues to be vital. Researchers will maintain a focus on social and behavioural research to learn as much as we can about behaviour, in order to prevent the spread of disease.

With all of these areas, how do you decide where to put your energies?

One of the central tenets of CIHR is that it is a partnership – we work in consultation with the full spectrum of people involved in health research, from those who fund the research, to those who carry it out, to those who use its results. HIV/AIDS is no different – we have an advisory committee that provides us with direction on priorities for funding, and we will consult with this committee as we continue our work.

Nonetheless, with all the resources available to us, both from the Canadian Strategy on HIV/AIDS and from CIHR's own commitment to research in this area, it is simply not enough. This is a tremendously complex disease, with no simple answers to either prevention or treatment. With existing resources, we choose our priority areas for study carefully and work to balance Canada's contribution both at home and abroad.

So are we ever going to beat HIV/AIDS?

I believe the answer is yes.

I also believe that what we are doing here in Canada holds the key to our eventual success. We are involving all the key players in the process in our research. We are helping to ensure that researchers talk with practitioners and with people with HIV or AIDS, as well as talking to each other, so that, for instance, biomedical or clinical researchers are learning from their colleagues in the population health or health services field – and vice-versa. We must focus on all areas of health research if we are ever going to beat this disease, without forgetting about the needs of those who already have it.

It may not be tomorrow, it may not be next year, but I firmly believe that we will learn how to eradicate HIV/AIDS – here in Canada and throughout the world.

For more information:

Canadian Institutes of Health Research
<http://www.cihr-irsc.gc.ca/index.shtml>

CIHR Institute of Infection and Immunity
<http://www.cihr-irsc.gc.ca/e/institutes/iii/13533.shtml>
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CIHR's Global Health Research Initiative
<http://www.cihr-irsc.gc.ca/e/strategic/13249.shtml>
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Canadian Strategy on HIV/AIDS
http://www.hc-sc.gc.ca/hppb/hiv_aids/index.html
http://www.hc-sc.gc.ca/hppb/vih_sida/index.html

Canadian HIV Trials Network
<http://www.hivnet.ubc.ca/ctn.html>
<http://www.hivnet.ubc.ca/ctnf.html>

Canadian Network for Vaccines and Immunotherapeutics (CANVAC)
<http://www.canvacc.org/accueilfix.htm>

