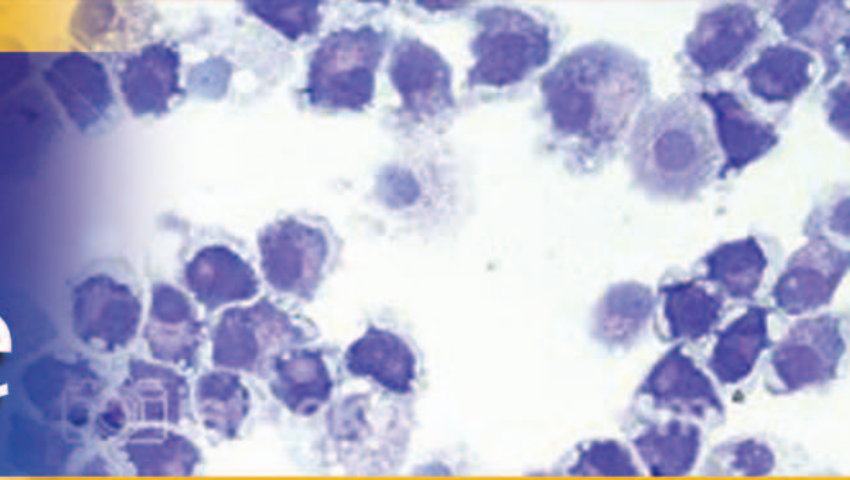




CANVAC
2000-2006

Vaccines for Life



Canadian Network
for Vaccines
and Immunotherapeutics



CANVAC is a hub for biologists, clinicians and social scientists engaged in vaccine research. Its mission is to support the development of vaccines and immunotherapies that will prevent and treat emerging viral infections, cancer and diseases related to HIV and hepatitis C (HCV).

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Member of the Networks of Centres of Excellence (NCE) program of the Government of Canada (1999-2006). The NCE program supports nationwide university-industry networks that train highly qualified personnel to convert their research into economic and social benefits for Canadians.

Université 
de Montréal

Hosted by Université de Montréal.

Executive summary

Cures for cancer, HIV, hepatitis C virus and emerging diseases such as SARS and avian flu are slow in coming. On the other hand, research is showing that vaccines or immune-based therapies for these diseases have a sound base for success—sooner rather than later.

Objectives

CANVAC looks forward to doing more of what it already does very well:

- Participating in Canada's preparedness plans to confront pandemics as a leading national resource;
- Conducting research with networks of highly qualified personnel from the private, public and non-profit sectors around the world;
- Completing more preclinical and clinical trials; and
- Attracting venture capital to the intellectual property (IP) it generates.

Key discoveries

Results from CANVAC-sponsored research are crucial links in the chain towards effective vaccine therapies.

NEW ADJUVANT (HELPER). 4-1BBL has become a prime candidate to boost immune systems and to be included in therapeutic anti-HIV and cancer vaccines.

SARS. A key immune molecule (IP-10) associated with the early stages of SARS remains high in some patients and could mean that their immune system is compromised. This discovery is likely to lead to the development of a vaccine.

NEW ANIMAL MODEL. The HCV mouse has received international recognition and is the basis for a start-up company, KMT Biotech, that is collaborating with high-profile pharmaceutical companies.

Key accomplishments

Because CANVAC literally built its program from the ground up, many of its accomplishments lie outside the Petri dish.

RESEARCH FUNDS AND FACILITIES. CANVAC and its partners leveraged \$179 million from granting agencies and governments for essential facilities. These include the largest laboratory in Canada to test HIV vaccines in non-human primates (\$22 million), the Institute for Research in Immunology and Cancer (\$40 million) and the National Immune Monitoring Laboratory (\$15 million).

TRIALS. Preclinical and clinical trials are making huge advances in vaccines for melanoma, HIV, HCV, breast and prostate cancer, SARS and Yellow Fever. Without these trials, progress towards successful vaccines could be delayed by several years.



Since 2000, CANVAC has become a key resource in the vaccine and immunotherapeutics world. Its research program is comprehensive—truly from bench to bedside—and complemented by raising awareness about vaccination and helping to develop public health policies.



Statistics 2000 - 2006

Cash funding
\$49.2 MILLION

In-kind funding
\$21.3 MILLION

Leveraged funds
\$178.8 MILLION

Publications
457

HQP
**average of 287
people/year**

Patents
33

Licences
14

Partners
150

Social research

Global pandemics and other bio-threats make the attitudes of the general public towards vaccination an important subject. CANVAC conducted a national survey revealing that 32% of Canadians were uninformed about how vaccines work. Studies on people at high risk of HIV and HCV addressed changes in their behaviour after being vaccinated. Other research analyzed the growing trend of parents who choose not to vaccinate their children. Results of such research affect the way public health policies are presented to Canadians.

Innovations

Six years—CANVAC's lifespan to date—is like the blink of an eye compared to the time it can take to bring a vaccine from theory to clinic. In those six years, the Network has had a remarkable number of successes.

Among the patents filed to date is one for a gene that can be used as an immune modulator in cancer trials. Another relates to genetically modified molecules that can be used as vaccine adjuvants. A pharmaceutical company is interested in licensing an antibody cocktail that measures T-cell populations—deficient in HIV patients—closest to the thymus; sanofi pasteur has recently licensed a molecule that can increase the potency of a wide range of vaccines.

CANVAC's ImmunArray detects variations in gene expression associated with protective immune responses and permits more user-friendly analyses in clinical trials. Over 2,000 arrays have been distributed throughout the immunological scientific community in Canada.

The Network plans to develop an inventory of vaccine-related IP in Canadian universities and research institutes, and “bundle” it into packages that will attract venture capital.

Highly qualified personnel

CANVAC has grown into an important global force in vaccinations and therapeutics because excellent researchers produce excellent results. Nine CANVAC investigators were acknowledged as world leaders in their fields by the Canada Research Chairs Program in 2002. Many researchers have won international accolades. On average, some 287 people, from technicians to professors, are involved in the Network each year. Until recently, only three laboratories were researching basic HCV virology and immunology in Canada. CANVAC now funds seven laboratories.

CANVAC will continue to have an important impact on the biotech and knowledge-based economy in Canada by providing the laboratories and expertise necessary to confront global pandemics.

Goals and objectives

Over 270 million people worldwide (including approximately 250,000 Canadians) are currently infected with hepatitis C (HCV). Breast and prostate cancer combined kill 10,000 Canadians every year. Of the 48 million people currently living with HIV/AIDS, 45,000 are Canadians. The 2003 SARS outbreak in Toronto brought that city's economy to its knees. The H5N1 avian flu is approaching.

In spite of global efforts, cures for these diseases are unlikely to be found in the short term. Research is showing, however, that vaccines or immune-based therapies stand a good chance of improving the efficiency of other treatments.

Since 2000, CANVAC has become a key resource in the vaccine and immunotherapeutics world by:

- Centralizing many aspects of vaccine development in Canada;
- Creating essential facilities to accelerate research;
- Bringing together research talent from the private, public and non-profit sectors—nationally and internationally; and
- Designing a program that rapidly advances discoveries into clinical trials.

Complementing the science, CANVAC's social program on the general public's awareness of vaccination programs is helping governments to develop appropriate public health policies and messages.

As it moves into its next phase, CANVAC's objective is to further develop areas of success. Promising vaccine candidates will be tested *in vitro* and in animal models, and successful ones advanced into clinical studies. CANVAC will continue to establish collaborations that integrate socio-behavioural studies within its projects and to increase its international presence. It will also continue to provide an environment in which research can generate intellectual property (IP).

First and foremost, CANVAC will be part of Canada's arsenal to confront pandemics by:

- Supporting Canada's commitment to developing countries in the fight against poverty-related diseases and towards global health security;
- Helping to develop Canada's vaccine strategies; and
- Becoming an important national resource for the vaccine biotechnology industry.

“The important thing in science is not so much to obtain new facts as to discover new ways of thinking about them.”

Sir William Bragg (1862 - 1942)



A single therapeutic HIV vaccine with an estimated efficiency of 20% would save the Canadian healthcare system approximately \$630 million.

Research program—now and in the future

CANVAC focuses on cancer, HIV, HCV and emerging viral diseases such as SARS because they are all life-threatening diseases for which vaccine-based therapies are sound. The research program is comprehensive—from *infrastructure* (building laboratories), to *science* (discovery, preclinical development, assay development to measure immune responses and clinical trials) and *social research* (helping the government to create strategies and policies to raise vaccine awareness among the general public).

Specifically, CANVAC's research program is organized around seven priorities:

- The biology of dendritic cells used as vaccine candidates;
- Immune monitoring to identify correlates of immune protection in vaccinated volunteers;
- Mucosal HIV vaccines for Africa;
- Therapeutic HCV vaccines;
- Breast and prostate cancer vaccines;
- Emerging viral diseases, particularly SARS and avian flu; and
- The social sciences as they relate to vaccination.

The program has been designed to:

- generate knowledge by building networks of multidisciplinary teams;
- transfer knowledge to patients and society;
- share knowledge through its centralized core facilities;
- train highly qualified personnel; and ultimately
- maximize the commercial potential of any discoveries.

Results are flowing due, in part, to the centralized core facilities (see page 12) that researchers can access to cut the cost of duplicating equipment in several laboratories. To date, *ex vivo* experimental systems and *in vivo* animal models have been developed to evaluate the efficacy of potential vaccines. Preclinical and clinical trials of some are under way (HIV, melanoma, breast and prostate cancer). HIV vaccine preparedness studies have been carried out in Africa.

Partnerships are essential for CANVAC to maintain the pace of its research. To that end, the Network will identify and recruit other public and private sector organizations worldwide with which it can synergize its own goals and commercialize IP. With those partners, CANVAC will move more research forward into preclinical and clinical trials. To date, phase I and II clinical trials are planned in HCV, cancer immunotherapeutics and HIV vaccination.

To achieve these objectives, CANVAC will continue to leverage funding from national and international sources.

“As a result of CANVAC, there is much more activity in vaccine development in Canada than before.”

Neal Nathanson
Associate Dean of Global
Health Programs,
University of Pennsylvania

Key research results

ADJUVANT. An adjuvant is a biological substance or small molecule that enhances immune responses.

SIMP. Researchers have cloned a gene (SIMP—Source of Immunodominant MHC-associated Peptides) that increases the levels of antigens and MHC (Major Histocompatibility Complex) on the cell surface. A patent titled *Increasing the immunogenicity of a selected protein by coupling same to SIMP/STT3-B or Itm1/STT3-A protein or a protein fragment thereof* has been filed. Researchers plan to use SIMP as an immune modulator in upcoming cancer trials.

THYMIC FUNCTION. To better evaluate thymic function (which is deficient in HIV-infected people and after chemotherapy), researchers narrowed down a cell surface phenotype that identifies recent thymic emigrants (RTEs)—the T-cell population closest to the thymus. Identifying an RTE phenotype by flow cytometry allows them to be tracked. A pharmaceutical company has shown interest in developing and licensing an antibody cocktail to quantify this phenotype.

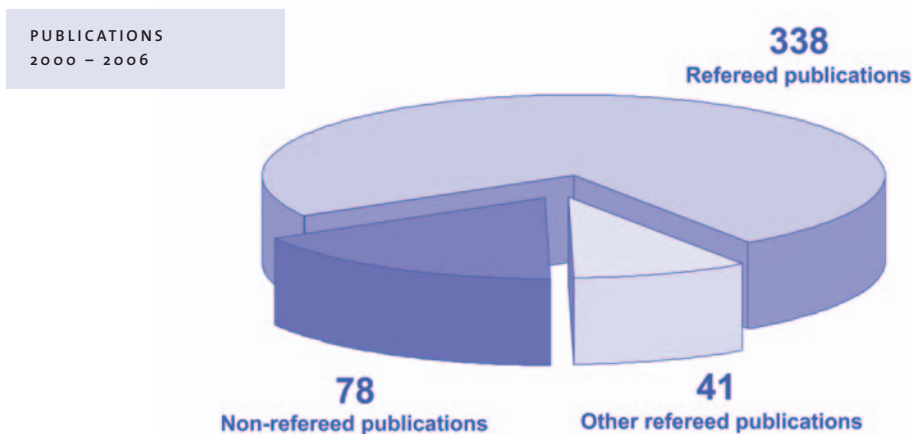
4-1BBL. In comparisons with other tumour necrosis factor family ligands, 4-1BBL turned out to be the most potent and consistent adjuvant for antiviral CD8 T-cell responses at low Ag dose. *In vivo* testing confirmed that 4-1BBL can be used as an adjuvant to enhance the priming of antiviral CD8 T-cell responses. As such, it has become a prime candidate for inclusion in therapeutic anti-HIV and cancer vaccines. Two papers on 4-1BBL, involving several CANVAC laboratories, were published in the *Journal of Immunology*.

ANIMAL MODELS. The various components of vaccines and immunotherapies can be tested and evaluated quickly *in vivo*.

NEW HCV scid uPA MOUSE. The HCV mouse has received international recognition and is the foundation for a start-up company, KMT Biotech, that is collaborating with high-profile pharmaceutical companies. It is extremely useful in immune reconstitution experiments to understand the immune response to HCV and in improving the design of HCV vaccines.



CANVAC researchers obtained \$22 million from the Canada Foundation for Innovation (CFI) to build the largest facility in Canada to test HIV vaccines in non-human primates. This facility will be operational in March 2007.





“CANVAC has become a recognized site of research expertise and clinical knowledge and will continue to put Canada at the leading edge of vaccine research.”

Emil Skamene
Professor of Medicine
McGill University Health Centre

Key research results

NEW TECHNOLOGIES TO MEASURE IMMUNE RESPONSES.

Developing tools to assess immune responses and to identify correlates of immune protection is important to accelerate the development of vaccines.

TETRAMERS. To identify HIV-specific CD4⁺ T-cells in human white blood cells, researchers developed tetrameric MHC molecules, covalently complexed with peptides. Tetramers detecting several antigenic specificities have been licensed to the US National Institutes of Health (NIH).

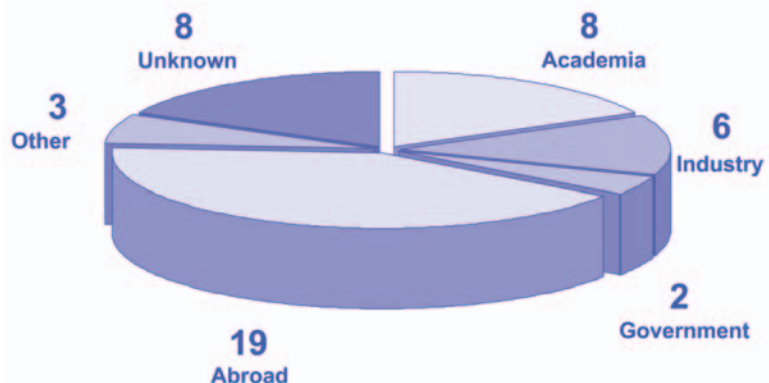
IMMUNARRAY. To facilitate genomic work with its partners, CANVAC created the ImmunArray—a cDNA array initially composed of some 2,000 well-defined human genes with immune-related functions. The ImmunArray detects gene expression variations associated with immune responses to infectious agents or to vaccines. It will permit more user-friendly analyses in upcoming clinical trials. Over 2,000 arrays have been distributed throughout the immunological scientific community in Canada.

IMMUNE MONITORING STUDIES. CANVAC scientists identified key immune factors associated with the early stages of SARS. They examined the blood from SARS patients for key immune molecules and found that one, known as IP-10, was very high in the blood of all SARS patients at the beginning of their illness. Researchers believe that continued high levels of IP-10 mean that the immune system is compromised. This study is likely to pave the way to the discovery of a vaccine.

HIV EPITOPES. An HIV-specific IgA, capable of neutralizing a broad range of HIV isolates and inhibiting HIV transcytosis, has been detected in 70% of HIV-resistant sex workers. Researchers identified, characterized and obtained patent protection for a novel interaction with gp120 and the potent neutralizing antibody IgG1b12. This project was partially funded by the Bill & Melinda Gates Foundation.

NATIONAL IMMUNE MONITORING LABORATORY. This facility, developed in collaboration with MDS Pharma Services and funded by the CFI, will increase the number of clinical trials, allow researchers to identify correlates of immune protection and attract partnerships with industry—possibly leading to a new revenue stream. The facility will open in November 2006.

POST-NETWORK EMPLOYMENT OF STUDENTS
AND POSTDOCTORAL FELLOWS
2000 - 2006



Key research results

CLINICAL TRIALS. CANVAC researchers collaborate with other investigators experienced in designing trials, conduct trials across multiple sites, evaluate and incrementally enhance vaccine platforms, and obtain consistent immune outcome analyses.

MELANOMA. Researchers successfully completed a pilot clinical study using Ad-transduced dendritic cells (DCs) in patients suffering from advanced metastatic melanoma. They aim to treat more patients suffering from stable metastatic melanoma using multiple injections of Adgp100-transduced autologous DCs to further understand the safety profile of the therapy and to establish preliminary data on efficacy.

BREAST CANCER. Based on preclinical results combining Ad-based gene transfer and DC-based therapy, researchers are conducting a phase I clinical trial during which AdHER-2 transduced autologous DCs are being administered as a cellular vaccine to patients with metastized breast cancer. The primary objective of this study is to estimate the proportion of patients who develop or increase anti-human HER-2 immunity. Researchers obtained a \$1.7 million grant from the Canadian Breast Cancer Research Alliance to carry out this trial.

HIV. Researchers are studying the immune response to HIV in infected individuals who receive highly active antiretroviral therapy (HAART). The approach combines a canarypox vector from sanofi pasteur and inactivated HIV viral particles from The Immune Response Corporation. The trial is being conducted with several Canadian partners, including the HIV Clinical Trials Network.

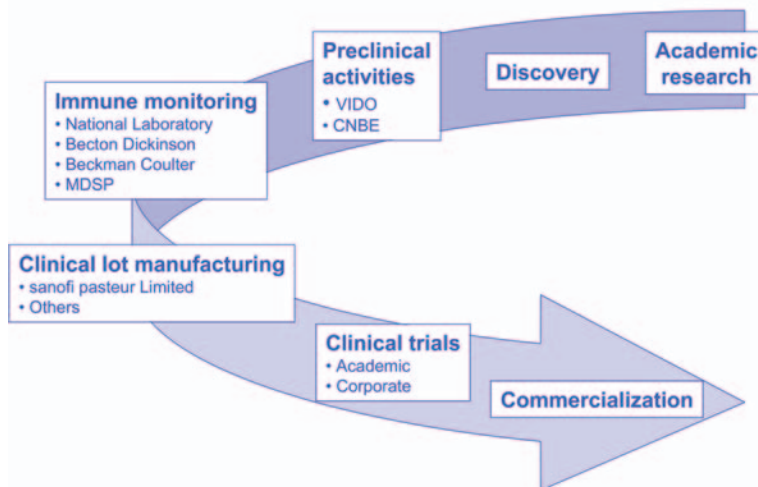
HEPATITIS C. CANVAC and Transgene are collaborating on a vaccine trial funded by the Canadian Institutes of Health Research (CIHR) to reinforce cellular immune responses in HCV patients. CANVAC is coordinating the clinical trial sites and the immune monitoring.

SARS. Researchers identified 10 T-cell epitopes of the SARS-CoV N protein in SARS patients. Immunodominant T-cell epitopes in the N protein are associated with recovery from the disease and could be used to develop a vaccine.

CANVAC has a proven history of successful preclinical and clinical trials.

In the next phase of the research, results will lead to other trials for HIV, HCV, and prostate and breast cancer.

THE RESEARCH CYCLE





“With the creation of CANVAC, I have seen a significant increase in the number of new approaches being tried in Canada and I am encouraged. Canada needs CANVAC.”

Bob Phillips
President and CEO
Ontario Cancer Research
Network

Key research results

SOCIAL RESEARCH AND POLICY DEVELOPMENT. Because of the complexity of vaccine issues, the anti-vaccine movement and the possible need for vaccinations after bio-terrorist events, CANVAC believes it is important to assess the knowledge and attitudes of the public towards vaccination. Bearing in mind the multitude of pandemic infection threats, this is an important issue—not only in Canada but all over the world. In this regard especially, CANVAC has become a truly global network.

VACCINE SURVEY. CANVAC conducted a national survey of vaccine knowledge and attitudes. The survey indicated a significant need for education about vaccines, given that a large proportion of Canadians were uninformed about how vaccines work (32%); critical, uninformed or undecided about vaccine production safeguards (56%); and critical, uninformed or undecided about the safety testing of vaccines (33%). The survey will affect the way public health policies are presented to Canadians.

PEDIATRIC VACCINATIONS. Citing the potential for harm, 5% of Canadian parents are choosing not to vaccinate their children. Pro-vaccination groups believe such decisions are exposing children to unnecessary risk. The debate on childhood vaccination has ethical, legal and public health consequences. CANVAC received funding from the CIHR to study this debate. Researchers analyzed available data to identify current trends and made recommendations to the National Advisory Committee on Immunization for revisions to public health policy.

POPULATIONS AT HIGH RISK OF HIV AND HCV. Studies on men who have sex with men and injection drug users showed a need for targeted education and prevention programs. The research also addressed changes in behaviour associated with vaccination and disclosure of the diseases.

AFRICA—VACCINE PREPAREDNESS. University Health Network, McMaster University and CANVAC participated in a vaccine preparedness study in Uganda that was conducted ahead of a planned clinical trial of a prophylactic HIV vaccine in that country.

MAJOR COLLABORATIVE RESEARCH AGREEMENTS

Antigenics	IDM Biotech
Beckman Coulter	Innate Pharma
Becton Dickinson and Company	Microscience Limited
bioMérieux SA	Pure Protein, L.L.C.
BioVex	sanofi pasteur Limited
Ciphergen Biosystems, Inc.	Transgene
DC Bio Corp.	Vasogen
Exonhit Therapeutics, SA	

Technology transfer

Backed by the Technology Commercialization Committee and the Director of Business Development, CANVAC is successfully working with researchers and their institutions to identify, protect and commercialize IP developed within the program.

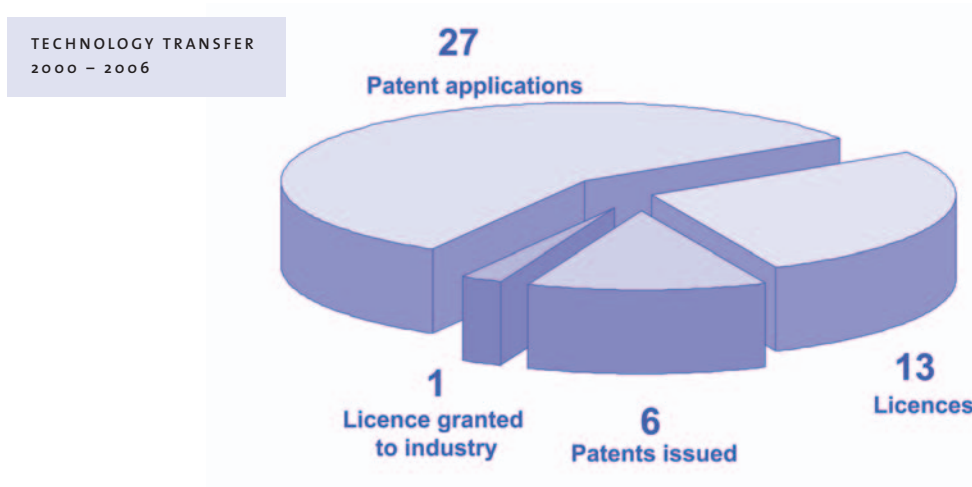
- Among others, a patent was filed relating to genetically modified molecules that can be used as vaccine adjuvants. Another describes a new method of measuring the output of the thymus and its diversity. A third covers a mouse model with hepatitis B and C virus.
- sanofi pasteur licensed a novel immunostimulatory molecule (an integral component of major breast cancer and HIV vaccine development programs) developed at Université de Montréal. The molecule can be used to increase the potency of a wide range of vaccines.
- CANVAC negotiated a licence with University Health Network and Beckman Coulter for a SARS-related diagnostic. CANVAC and UHN have agreed to share any benefits arising from this licence.
- One of CANVAC's most successful relationships is with Becton Dickinson, with which it is developing a series of technologies to monitor immune responses. It is also negotiating a licence to the company from Val-CHUM for diagnostic tools that detect thymus function. Other elements of this technology may be further commercialized through a spin-off company.

CANVAC believes “bundling” IP creates a more attractive licensing package or a stronger spin-off company. As part of its future technology transfer and financial strategies, the Network plans to develop an inventory of vaccine-related IP in Canadian universities and research institutes to identify opportunities for commercialization.



“The CANVAC network offers tangible opportunities to do business.”

Robert Dubé
Senior Partner
Le Groupe CRÉA inc.



CANVAC PARTNERS 2000-2006

MEMBER INSTITUTIONS

Canadian HIV Trials Network
 Centre de recherche du Centre hospitalier affilié
 de l'Université de Montréal
 Centre de recherche du CHU Sainte-Justine
 Hôpital Maisonneuve-Rosemont
 Institut de recherches cliniques de Montréal
 Lady Davis Institute for Medical Research
 McGill University
 McMaster University
 Mount Sinai Hospital, Toronto
 Ottawa Health Research Institute
 Providence Health Care
 Research Institute of the McGill University
 Health Centre
 Robarts Research Institute
 Sunnybrook Women's Health Science Centre
 Université de Montréal
 Université Laval
 University Health Network
 University of Alberta
 University of British Columbia
 University of Manitoba
 University of Saskatchewan
 University of Toronto

CORPORATE MEMBERS

Altea Therapeutics Corporation
 Amgen Inc.
 Argos Therapeutics, Inc.
 Becton Dickinson and Company
 Beckman Coulter, Inc.
 BioVex Ltd.
 Cangene Corporation
 CIPHERGEN Biosystems, Inc.
 DC Bio Corp.
 EpiVax, Inc.
 GlaxoSmithKline
 IDM Biotech Limited
 Innogenetics NV
 KMT Hepatech, Inc.
 Microscience Limited
 Pure Protein, L.L.C.
 sanofi pasteur Limited
 The Immune Response Corporation
 Vasogen Inc.
 ViRexx Medical Corp.

GENERAL MEMBERS

Agence nationale de recherche sur le SIDA
 Albert B. Sabin Vaccine Institute
 Bill & Melinda Gates Foundation
 Canadian AIDS Society
 Canadian Blood Services
 Canadian Breast Cancer Research Alliance
 Canadian Foundation for AIDS Research
 Canadian HIV-AIDS Legal Network
 Canadian International Development Agency
 Canadian Society of Hospital Pharmacists
 Canadian Treatment Action Council
 Centre d'entreprises et d'innovation de Montréal
 Community AIDS Treatment Information Exchange
 Farha Foundation
 Fonds de la recherche en santé du Québec
 Hepatitis C Society of Canada
 International AIDS Society
 International AIDS Vaccine Initiative
 Joint United Nations Programme on HIV/AIDS (UNAIDS)
 Kenya AIDS Vaccine Initiative
 National Cancer Institute of Canada
 National Cancer Institute of Canada—Clinical
 Trials Group
 National Health Research Institutes, Taiwan
 National Institute of Allergy and Infectious Diseases
 —National Institutes of Health
 Office of AIDS Research, National Institutes of Health
 Réseau sida et maladies infectieuses du Fonds de la
 recherche en santé du Québec
 The Canadian Association for HIV Research
 The Ontario HIV Treatment Network
 Vaccine and Infectious Disease Organization
 Wisconsin National Primate Research Center, University
 of Wisconsin-Madison

Networking and partnerships

CANVAC has a strong reputation for networking and building global partnerships with the private sector and non-profit organizations. This has allowed the Network to gain access to resources and push the research far beyond what it could accomplish by itself.

NATIONAL NETWORKING. In response to the SARS outbreak, CANVAC launched two project streams and—with the Institute of Infection and Immunity of the CIHR, other organizations and industry partners—formed the Canadian SARS Research Consortium.

CHIVE (Canadian HIV Vaccine Enterprise) is the world's first public/private partnership dedicated to developing a vaccine for HIV. CHIVE partners are CANVAC, sanofi pasteur, National Microbiology Laboratory, CIHR and Canadian HIV Trials Network.

INTERNATIONAL NETWORKING. CANVAC was honoured to organize the *AIDS Vaccine 2005* conference in Montreal. This prestigious event—the leading forum on developing a prophylactic AIDS vaccine—gave CANVAC an opportunity to increase its visibility on the global stage and highlight the efforts of Canadian researchers.

CANVAC formed an international consortium to standardize the ICS (intracellular cytokine staining) assays used to monitor immune responses to vaccination. The standardization effort is being extended to other technologies.

PARTNERSHIPS WITH THE PRIVATE SECTOR. CANVAC's partnerships are built on long-term relationships, mutual respect and collaboration. Many partners (Becton Dickinson, sanofi pasteur, Beckman Coulter, Argos Therapeutics, DC Bio, among others) are committed to supporting the Network's ongoing projects. CANVAC will continue to seek out partners that complement its research activities and can commercialize IP.

“GSK Canada believes that CANVAC...is an important driver of collaborations between academia and industry.”

Barry Markowsky, VP Business Development, GlaxoSmithKline

A GLOBAL NETWORK



● Locations of companies working with CANVAC
 ● Locations of government/public organizations working with CANVAC

Highly qualified personnel (HQP) and training

EXCHANGE OF KNOWLEDGE. Seventy-two individuals received hands-on training in gene array technology in Montreal, Toronto and Edmonton. Ten people were trained in managing gene expression databases. Students and post-doctoral fellows from McMaster University transferred recombinant adenovirus technology to laboratories in Montreal and Toronto through personnel exchanges.

TRAINING PARTNERSHIPS. University of Western Ontario and sanofi pasteur are working to develop pox vectors for vaccines. Becton Dickinson exchanged training in advanced flow cytometry for CANVAC students against training for its personnel on tetramer technology.

GRADUATION. Since 2000, 21 students have graduated from 35 Canadian academic institutions. More than 40 students are expected to graduate next year.

CAPACITY-BUILDING. Until recently, only three laboratories were researching basic HCV virology and immunology. Currently, CANVAC funds seven laboratories.

MAJOR PRIZES AND ACCOLADES FOR CANVAC RESEARCHERS.

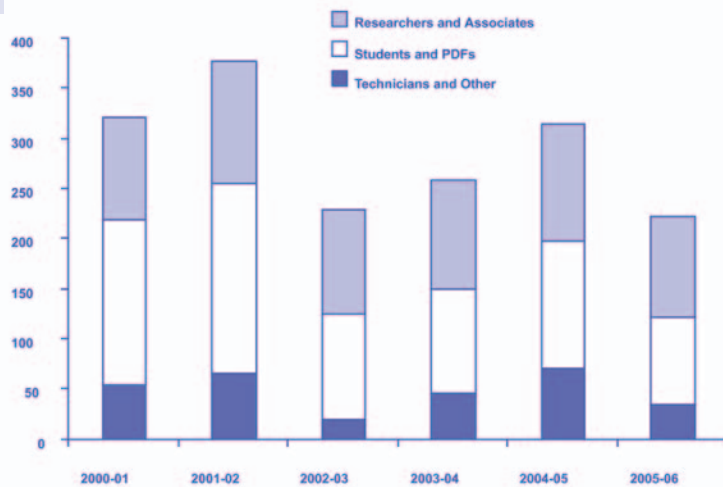
- Francis Plummer (University of Manitoba) and Lorne Babiuk (University of Saskatchewan) received a total of \$17.1 million from the Bill & Melinda Gates Foundation in 2005 to study factors associated with resistance to HIV infection.
- Tak Mak was elected to the National Academy of Sciences in 2002 in recognition of his achievements in original research. The Academy acts as an official advisory body to the US government.
- Nine CANVAC investigators were acknowledged as world leaders in their fields by the Canada Research Chairs Program in 2002.



“Through CANVAC ...trainees have access to internationally renowned research. The trainees will be uniquely positioned to make significant contributions... against infectious diseases.”

Keith Fowke
Curriculum Coordinator
CIHR/ICID National Training
Program in Infectious Diseases

HIGHLY QUALIFIED PERSONNEL





CANVAC's management structure allows it to rapidly adjust to new scientific and industry developments and keep its research program relevant.

Network management and core facilities

BOARD OF DIRECTORS. The Board is composed of academics and senior executives from the vaccine industry, the venture capital field, and the public and private sectors.

SCIENTIFIC ADVISORY BOARD. The SAB is composed of internationally renowned academics and private sector executives who provide good insight into the needs of the corporate sector. The Board relies on the SAB for scientific guidance.

RESEARCH MANAGEMENT COMMITTEE. The RMC includes theme and target leaders, and people who can provide direction in advancing the clinical trials. The Committee is responsible for monitoring the day-to-day progress of the program and allocating funds to individual projects. CANVAC's Program Leader/Scientific Director is the link to the Board.

CANVAC COORDINATING CENTRE. The CCC and Université de Montréal oversee the day-to-day functioning of the Network as well as financial management, partnerships and event-planning.

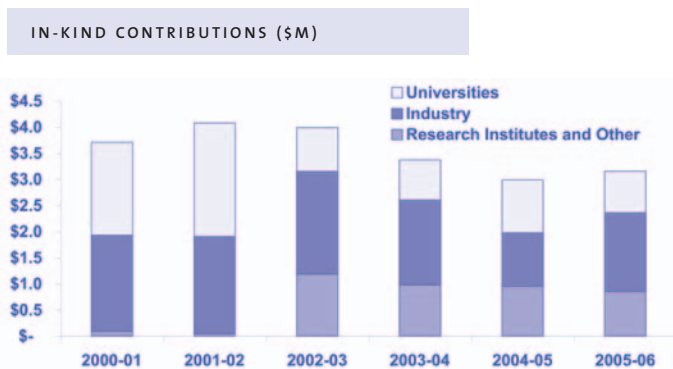
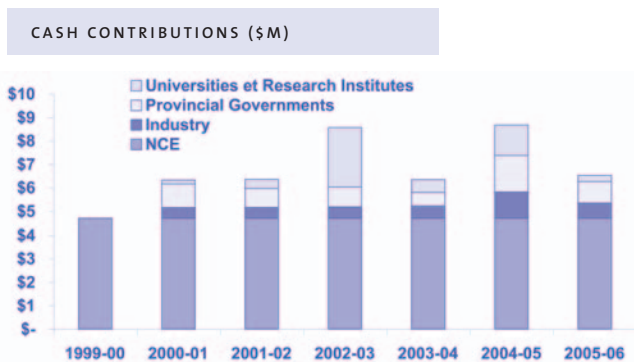
CORE FACILITIES. These services allow CANVAC's researchers and partners to share technologies, tools and essential reagents to which they would otherwise not have access.

- DNA Microarray Core. The ImmunArray detects gene expression variations associated with immune responses to infectious agents or to vaccines.
- MHC Antigen Typing Core. The laboratory types Class I and II antigens of the Major Histocompatibility Complex in humans.
- Tetramer Core Facility. The laboratory produces Class I and II tetramers that are critical to assess the antigen-specific T-cells induced by infectious agents, tumours or vaccines.
- Injection Drug User Cohort. Researchers gain access to valuable clinical samples from consenting patients suffering from HIV or HCV primary infection, or from people resisting infection despite repeated contact with HCV.
- Information Technology Service. Website- and database-hosting are offered to researchers. When the National Immune Monitoring Laboratory is completed, the range of services will expand.

Financial summary

Some of the contributions CANVAC leveraged between 2000 and 2006:

- \$31 million from the Canada Foundation for Innovation (CFI) to establish an Institute for Molecular Medicine and Health at McMaster University.
- \$26.9 million from Genome Canada to develop new approaches to vaccination via the mucus membranes at University of Saskatchewan.
- \$22 million from the CFI for a primate facility in Laval with P3 containment.
- \$15 million from Genome Canada/G enome Qu ebec to develop an in silica model of immune responses.
- \$13.2 million from the CFI to build and manage a National Immune Monitoring Laboratory at Universit  de Montr al.
- \$3.7 million from the CFI for an HIV research laboratory in Kenya.
- \$3 million from the CFI for a Centre of Excellence for Viral Hepatitis Research at University of Alberta.



BUNDLE IP. By seeking out IP from other organizations that complements its own and packaging it in a way to interest industry, CANVAC will increase its chances of commercializing its own IP and gaining financially.

COMMERCIALIZE THE IMMUNE MONITORING PROCESS. Under the terms of the \$13.2 million CFI award, the Immune Monitoring Laboratory’s first five years are dedicated to academic use. During that time, CANVAC will establish automated assays acceptable to industry. Subsequently, companies developing small molecules or biologicals will have access to the automated assays, creating a customer and revenue base.



Both Universit  de Montr al and University of Alberta have agreed to share the proceeds (34% of any revenue they receive) of commercialized IP from CANVAC-sponsored projects.

The Chairman and the Program Leader look to the future

“CANVAC is poised to become the National R&D network for an integrated infectious disease strategy.”

Jean-Jacques Bertrand,
Chairman

Rafick-Pierre Sékaly,
Program Leader and
Scientific Director



Réseau canadien pour l'élaboration de vaccins et d'immunothérapies
Canadian Network for Vaccines and Immunotherapeutics

March 31, 2006

To CANVAC's members, researchers and partners:

Since the Board of Directors established CANVAC as a not-for-profit corporation in April 2000, the Network has successfully integrated the sectors involved in vaccine R&D and policy. We have fulfilled the NCE's criteria for excellence and conducted some of the best research in the field. On so many fronts, success is either at hand or just a few more steps away. CANVAC is poised to become *the* National R&D network for an integrated infectious disease strategy. CANVAC works!

None of this could have happened without the NCE program and the tremendous contribution of everybody involved: our researchers, students and post-doctoral fellows who have worked so hard at building an impressive critical mass of scientists dedicated to vaccine R&D; members of the Coordinating Centre who identified partnerships and ensured the flow of resources. Our corporate, academic and public partners were there from the beginning. Through their trust and partnerships, we have learned to work in another dimension—one that can ease our transition to a new operation. Our Scientific Advisory Board members ensured the cohesion and excellence of our scientific agenda. They have played a critical role in our development. The Board of Directors has always been proactive in opening new avenues and promoting the Network in Canada and abroad.

CANVAC's federal funding ends in 2006. We must now find stable, long-term sources of financing to continue the research. We will be looking to our long-standing partners and to new ones; to federal and provincial sources; to not-for-profit and corporate organizations. This is certain—we will leave no stone unturned.

Our researchers and partners are ready to help build a healthier future for Canadians and people around the world—a future we are all looking forward to with enthusiasm and confidence. A future we can build with vaccines for life.

Yours truly,

Jean-Jacques Bertrand
Chairman of the Board

Rafick-Pierre Sékaly
Program Leader and Scientific Director

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