



Networks of Centres
of Excellence of Canada

Réseaux de centres
d'excellence du Canada

Canada 

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Chair's Message

Mobilizing research and innovation for the benefit of Canadians is what the Networks of Centres of Excellence (NCE) have been helping the country's best and brightest do for the past 20 years. And, as all governments know, doing things better is the innovative mettle that brings sustainable economic growth and a better quality of life for its citizens. This is even more important during challenging economic times.

The networks and centres play a strategic role in this innovation mosaic as part of the federal government's science and technology (S&T) strategy. They act as catalysts in mobilizing and energizing skilled individuals and teams from across the country to translate promising research into practical solutions that address many of our country's greatest health, environmental, societal and economic challenges.

The NCE continued to address Canada's S&T priority areas this past year with the approval of three new networks that mobilize the nation's research excellence to help children with developmental brain disorders, to lessen the impact of fossil fuels on the environment, and to exploit social media to improve education and skills development. The NCE also launched a third round of the Centres of Excellence for Commercialization and Research (CECR) program in 2009, with 11 applicants short-listed to apply for three to four new centres.

Training the next generation of skilled workers continues to be a priority for the NCE, which has become the country's largest university training program in applied research. In addition to the nearly 2,000 graduate and post-graduate students supported this past year through the networks, the Industrial R&D Internship program supported another 1,000 students, providing them with opportunities to work on-site with companies to address pressing industry problems.

Strengthening Canadian innovation also depends on small and medium-sized enterprises (SMEs)—the lifeblood of Canada's economy—investing more in R&D. That is why the NCE established a special fund to encourage SMEs to partner with Business-Led Networks in R&D and pre-commercialization activities. Such partnerships will help to create, expand and retain homegrown companies that are able to capture new markets with new innovations.

The NCE continued to increase its focus on commercialization this past year under the guidance of its Private Sector Advisory Board (PSAB). Although still early days for the CECR and BL-NCE programs, PSAB concluded in its 2009 impact report that the importance of these programs cannot be overstated, particularly given Canada's current innovation and commercialization climate. A separate evaluation of the CECR program in 2009 noted that the selection process "was widely praised as a key mechanism to ensure that funded centres will achieve the program's intended research and commercialization outcomes."

The NCE's success depends on the participation and support of the private sector, universities, not-for-profit organizations and all levels of government. It also relies on the skilled contributions from its expert panels and PSAB. This hard work and commitment to the NCE mission is greatly appreciated.

Of course, none of what the NCE have accomplished would have been possible without the vision and continued support of the Government of Canada. The results of this past year, and the past 20 years, are proof that the government's investment in the NCE is producing valuable returns.

Suzanne Fortier, PhD
Chair, NCE Steering Committee

Year in Review

Looking Back: A Year in Review

Canada's ability to stimulate economic growth depends on the discovery, innovation and commercialization of new products and services. Producing such results is what the Networks of Centres of Excellence (NCE) does best.

This year's annual report highlights how the government's commitment to commercialization and knowledge translation continues to empower the NCE and its partners to bring practical solutions faster than ever to Canadians.

Towards this end, in 2009-10 the NCE approved three new research networks. Each network will operate on three five-year funding cycles, and under criteria designed to increase accountability and place greater emphasis on generating concrete, multifaceted solutions to issues critical to Canadians.

The new networks are:

- Graphics, Animation and New Media Canada (GRAND), led by Dr. Kellogg Booth from the University of British Columbia, which will explore novel social media, e-learning and 'edutainment' environments that enhance learning and skill development;
- NeuroDevNet, led by Dr. Daniel Goldowitz, also from the University of British Columbia, which will study ways to reduce the long-term costs to the health care system through early intervention and effective treatment of children with developmental brain disorders; and
- Carbon Management Canada (CMC-NCE), led by Dr. Stephen Larter from the University of Calgary, which will develop technologies necessary to "decarbonize" fossil fuel production and use.

The NCE further strengthened Canada's ability to commercialize promising research with a new \$57-million competition for the Centres of Excellence for Commercialization and Research (CECR). Proposals for the third CECR competition will be evaluated on the potential benefits to Canada, the strength of the business plan and the team track record. Eleven applicants were invited to apply for up to four centres.

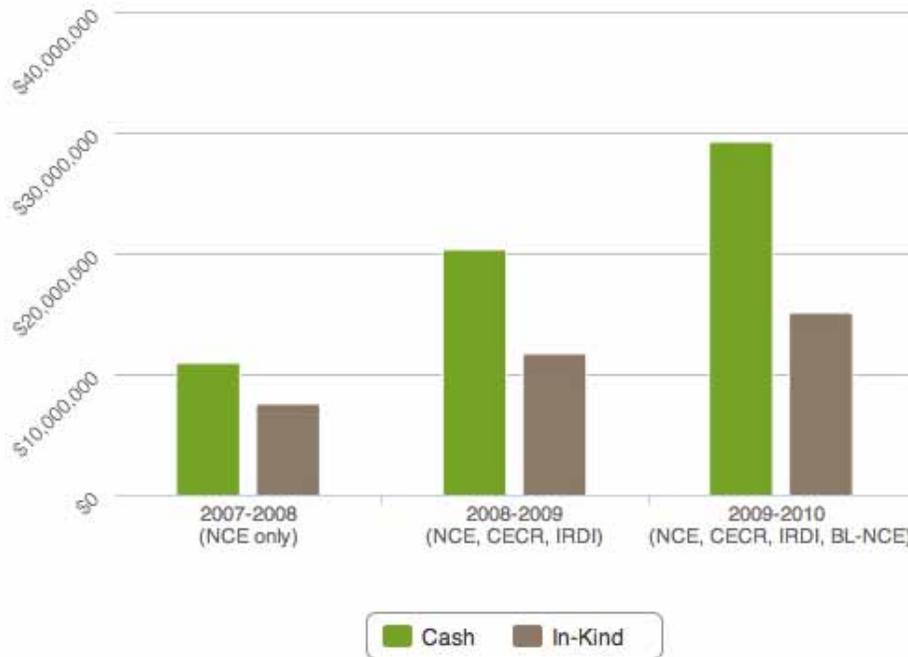
Encouraging collaborations between academia and small- and medium-sized enterprises (SMEs) is another priority of the NCE. In response, the NCE established a new fund that will make it easier for SMEs to partner with Business-Led Networks in research and development and pre-commercialization activities.

This past year witnessed the greatest level of industry collaboration since the NCE was established 20 years ago. Industry partners invested more in NCE programs in 2009-10 than in the previous 12 months, despite continued economic uncertainty.

For a full menu of NCE 2009-10 data

Growing involvement from the private sector is a direct result of recent NCE initiatives that give companies even more opportunities to partner with universities to produce practical research results.

Industry Contributions 2007-10



A few highlights from 2009-10:

Refer to our Innovation Impacts section for more highlights

Networks of Centres of Excellence (NCE) Program

- Kitchener, Ont. entrepreneur Kurtis McBride and scientist Dr. Erik Hadley know the value of working on research that is important to industry. McBride's graduate work with GEOmatics for Informed DEcisions Network (GEOIDE) led him to launch a new company that is selling its product globally.
- The Canadian Water Network (CWN) is helping both small and rural as well as First Nations communities develop affordable solutions for delivering safe drinking water.
- Intelligent Sensing for Innovative Structures (ISIS Canada) is collaborating with the federal government on ways to protect the Parliament buildings from earthquakes and environmental strains.
- Toyota Canada has partnered with AUTO21 NCE as part of a national project to test new plug-in vehicles.

Centres of Excellences for Commercialization and Research (CECR) Program

- In Sarnia, Ont., the Bioindustrial Innovation Centre (BIC) has signed up the first tenant for its new laboratory and demonstration facilities. Woodland Biofuels Inc. plans to hire 30 employees initially to scale up and test new technology for conversion of wood to fuel-grade ethanol.
- The Canadian Digital Media Network (CDMN) and the biggest companies in digital media are working with academia, investors and skilled workers to transform regional clusters of digital media expertise into a national powerhouse.

- With support from the Centre of Excellence for the Prevention of Organ Failure (PROOF Centre), a simple blood test that eliminates the need for invasive and expensive biopsies is on track to seek regulatory approval in 2011 from Canada and the United States.
- Ocean Networks Canada Centre for Enterprise and Engagement (ONCCEE) has landed the first international export for a technology developed as part of the VENUS and NEPTUNE Canada underwater observatories. It will warn citizens in the Mediterranean of incoming tsunami waves.
- In Toronto, MaRS Innovation (MI) is working with a spin-off company to commercialize a portable device that can test if a patient has cancer.

Business-Led Networks of Centres of Excellence (BL-NCE) Program

Industry partners in the Business-Led Networks are moving quickly to bring new technologies to market. Domtar and FPInnovations, for example, are building a \$41-million nanotechnology plant that can convert wood fibres into lighter, stronger and greener material for use in bioplastics and high-durability varnishes. The plant will produce industrial quantities of the material for ArboraNano.

In Montreal, a small biotechnology company is working with three of the world's largest pharmaceutical companies, as part of the Quebec Consortium for Drug Discovery (CQDM), to develop a diagnostic test that can better predict the onset of diabetes and monitor how patients react to different drugs.

Industrial Research and Development Internship (IRDI) Program

The IRDI program gives companies another incentive to partner with academia; about 600 graduate students and post-doctoral fellows were placed with companies in 2009-10 to work on practical business problems, and to expose the private sector to the benefits of science and technology.

Celebrating Two Decades of Results: NCE's 20th Anniversary

One of the most memorable highlights of 2009-10 was the NCE's 20th anniversary celebration that featured a keynote presentation by Canadian astronaut Dr. Julie Payette. The anniversary provided an opportunity for Canada's research community—and the beneficiaries of this research—to showcase how two decades of networking and collaboration between sectors and disciplines are making Canada a more prosperous, healthy and sustainable society.

The NCE networks have trained thousands of highly qualified people, created new policies for natural resource management, and developed national disease and treatment strategies. Other accomplishments from the past 20 years include:

- *39 NCE Networks established since 1989 (17 ongoing);*
- *17 Centres of Excellence for Commercialization and Research created;*
- *4 Business-Led Networks of Centres of Excellence created;*
- *Over 1,700 NCE partners involved annually;*
- *Thousands of patents and hundreds of licenses obtained;*
- *Over 150 spin-off companies created;*
- *Hundreds of students trained in innovative industry settings;*
- *Proof of concept demonstrated and supported across sectors;*
- *Policy and practice impact demonstrated; and*
- *Government priorities supported.*

Tackling Canada's Innovation Gap Through Commercialization and Knowledge Transfer

Increasing Canada's productivity and competitiveness through innovation is a major priority for the country. The Networks of Centres of Excellence (NCE) contribute to these goals by creating opportunities for the private sector to invest more in research and development and to hire more doctoral and master's level graduates, and also by encouraging Canada to turn publicly funded research into money-making products and services.

The model has proven so effective that the federal government has made the program its main engine for knowledge mobilization and translation, and commercialization, says Perrin Beatty, President and CEO of the Canadian Chamber of Commerce and Chair of the NCE's Private Sector Advisory Board (PSAB).

"The NCE is catalytic," says Beatty. "It encourages partnerships between academic institutions and the private sector and it recognizes the importance of moving ideas out of university labs and into the marketplace. That's the 'D' part of research and development."

"We hope to reshape the culture for research and innovation in Canada, and that, I believe, will be the least appreciated but perhaps most important contribution the NCE can make."

Perrin Beatty,
President-CEO of the Canadian Chamber of Commerce
and PSAB member

Dr. Sue Abu-Hakima, President and CEO of Amika Mobile Corp. and fellow PSAB member, says while there is no magic bullet solution to Canada's innovation challenges, there is a growing consensus that the NCE program has become Canada's best bet for transforming world-class university research into solutions that address many of society's greatest challenges.

"I've been in research for 28 years now. I understand research, I understand business and I understand what it takes to be innovative in a company, in a university and a government research lab," says Abu-Hakima. "So I can tell you that the NCE's greatest accomplishment to date is to make research more practical."

How does the NCE make research more practical for Canada's construction industry? Read how Canada's \$1.7-billion cement industry, and the 27,000 workers it employs, could benefit from a GreenCentre Canada initiative to commercialize a greener and stronger type of cement.

The application of research continues to be a major priority for the federal government. Its recent support for three new NCE programs is accelerating the commercialization of university research, addressing industry-specific challenges and providing graduate students with hands-on industry experience.

Dr. Tom Brzustowski, RBC Financial Group professor in the commercialization of innovation at the University of Ottawa, says the NCE also bolsters Canadian innovation and prosperity by building national and regional teams with the critical mass to tackle large issues. He credits the Centres of Excellence for Commercialization and Research (CECR) and the Business-Led Networks of Centres of Excellence (BL-NCE) programs for attracting even greater industry participation.

"Innovation is a means, not an end," says Brzustowski. "If our goal is greater prosperity then it's essential that we have networks of researchers working closely with companies that create wealth. That keeps the researchers aware of what companies and their customers need, and produces some market pull for the research. This path to innovation has always been a feature of the NCE, but the BL-NCE and CECR initiatives give it more emphasis."

Leveraging Canada's university excellence and translating it into practical solutions through networking, collaboration and partnerships is a formidable task, says Dr. Peter Nicholson, Chair of the NCE Selection Committee and inaugural president of the Council of Canadian Academies. He says the NCE is an important driver in Canada's innovation mosaic, but cautions that innovation is incremental and takes time.

"People are captured by this metaphor of innovation as a "eureka" moment, and conclude that unless we're getting a steady stream of eureka's converting themselves into tens of thousands of jobs in the next few years, then somehow the public's investment in research isn't paying off,"

says Nicholson. “But the connection between research and a marketable product is complex and lengthy. The networks and centres play an important role in helping to narrow that gap and to speed the process.”

Putting ideas to work: Innovation comes from putting proven solutions into practice, says Dr. Peter Nicholson. The result may be a new commercial product or service, or a better quality of life for citizens. Here are a few examples of how the NCE has improved the lives of Canadians over the past year.

- The Allergy, Genes and Environment Network (AllerGen) is making life safer for children with severe allergies with a program that trains school teachers to recognize and manage anaphylactic shock, a life-threatening allergic reaction.
- The Canadian Stroke Network (CSN) is helping stroke victims regain their lives by putting into practice the best recovery research.
- The Canadian Arthritis Network (CAN) is working directly with First Nations, Inuit and Métis to improve the lives of adults with arthritis in their communities. CAN also worked with people affected by arthritis on a grassroots national campaign to raise awareness of this debilitating condition.

More Companies are Partnering with the NCE

In 2009-10, more companies (more than 1,200) participated in the Networks of Centres of Excellence (NCE) than ever before as a result of the Centres of Excellence of Commercialization and Research (CECR), the Business-Led Networks of Centres of Excellence (BL-NCE) and the Industrial R&D Internship (IRDI) programs. These private sector partners contribute financial support and provide access to specialized research resources. They are also often members of a network or centre's board of directors or scientific advisory committee, providing early-stage guidance that serves to increase productivity and marketability.

NCE strengthened its commitment to commercialization with the establishment of a Private Sector Advisory Board (PSAB), which provides expert advice and recommendations on the CECR and BL-NCE programs. The 16-member volunteer board is made up of senior industry executives representing many of the country's strongest technology sectors: information and communications technology (ICT), health and life sciences, energy and natural resources and environmental sciences.

Leveraging private sector funding and expertise: Private companies contribute time, resources and funding as NCE partners. Pfizer Canada, for example, is an active partner in four centres and one business-led network.

Dr. Sue Abu-Hakima, President and CEO of Amika Mobile Corp. speaks for both the ICT sector and small- and medium-sized businesses on the benefits of PSAB.

"I'm one of several hard-nosed people on the board and that's a good thing for the program," says Abu-Hakima, who started her career at National Research Council Canada before leaving to launch two start-up companies. "Having a brilliant eureka idea isn't enough—your idea has to stand up to business scrutiny. Is the application backed by a killer team that can make a difference? Do they have partners offering genuine and substantive support? Is the business model sound? Will it really create jobs?"

Dr. David Dolphin, Chair of the Centre for Drug Research and Development (CDRD), a Centre based in Vancouver, says university scientists are increasingly recognizing both the societal value of their research beyond publications and patents, and the importance of having potential users of their technology involved in the development process. He found having seasoned entrepreneurs on PSAB to review their application was beneficial.

“Most academics often lack the experience needed to commercialize a product,” says Dolphin, a world-renowned chemist who has worked in academia and industry. “It’s important to get feedback from people who have real-world experience in bringing products to market.”

After, the NCE has made its mark in transforming university culture. Dr. Lorne Babiuk, Vice-President Research at the University of Alberta and Chair of the Pan-Provincial Vaccine Enterprise (PREVENT) centre of excellence based in Saskatoon, says before the NCE, it was rare to see scientists from different universities and disciplines collaborate, let alone partner with industry.

“The NCE program has certainly made my job at the University of Alberta easier,” says Babiuk. “Researchers now see the value in protecting their intellectual property and collaborating with other academics and with industry, whether it’s through an NCE program or not. They see the direct benefit they can have on society.”

The value of collaboration: What happens when scientists working on human vaccines collaborate with researchers from animal health? A powerful combination that led a Belleville, Ont. company—Bioniche Life Sciences Inc.—to market a vaccine that could help prevent E.coli, a potentially deadly bacterial infection often caused from a contaminated water supply.

Raymond Leduc, Director of IBM Bromont—the largest semiconductor assembly and testing facility in the world—and member of PSAB, says the end-user or customer perspective is perhaps the greatest value industry advisors can bring.

“PSAB applies a lens that puts the consumer and the market front and centre [asking] who are the customers? how long will it take? how much will it cost to bring this technology to market? what value does it provide? and will it make a profit? Some may call this approach mercenary. I call it pragmatic,” says Leduc.

Shared Resources, Shared Funding, Shared Risk

Engaging end-users in the research process is one of the cornerstones of the Networks of Centres of Excellence (NCE). It keeps the research focused and builds the critical mass needed to tackle large problems.

This approach also shares the risk. Take the example of drug discovery. Dr. David Dolphin, Chair of the Centre for Drug Research and Development (CDRD), says the venture capital industry for biotech has virtually evaporated in Canada, and pharmaceutical companies are not as willing as 15 years ago to license early-stage drug trials from universities or start-up companies. To reduce the risk, these companies want projects at a later stage of development.

“The pharmaceutical and biotechnology sectors are enthusiastic supporters of the CECR and BL-NCE programs. We anticipate that the generation of proof of concept data and targeted commercial development arising from these programs will facilitate the uptake of innovative technologies by commercial partners. The sharing of resources across sectors will reduce risk to all partners, and allow Canada to be significantly more competitive in the global health care marketplace.”

Kevin O'Brien Fehr,
member Private Sector Advisory Board/ Director,
Basic Research and Genetics, GlaxoSmithKline Inc

But the NCE has three centres and one business-led network addressing this challenge. For example, CDRD enables researchers and drug manufacturers from different institutions and life sciences companies to access shared infrastructure and services across British Columbia. It helps academics and companies develop drugs from discovery to the preclinical stage, and sources additional capital and expertise to support further development.

“Twenty years ago, almost all the research that pharma did was in-house,” says Dolphin. “Now they’re increasingly looking to universities to develop drug candidates that they will eventually take over once they are more developed.”

Canada has the capacity within its academic institutions to conduct preclinical, phase 1 and early-phase 2 animal studies, but the resources are spread across the country. Saskatoon-based Centre Pan-Provincial Vaccine Enterprise (PREVENT) is leveraging this dispersed infrastructure and expertise to develop vaccines that can be licensed to an industry partner for late-stage clinical trials and commercialization.

Dr. Lorne Babiuk, Chair of PREVENT and Vice-President Research at the University of Alberta, says “there was a time when companies may have viewed this type of initiative as a competitive threat. Instead, they see it as pre-competitive research that they can all provide value and insight into.”

A new model for commercializing university health research has also been developed by the Prostate Centre’s Research Translational Initiative for Accelerated Discovery and Development (PC-TRIADD), a centre based in Vancouver. PC-TRIADD acts as a bridge between academia and the biotechnology and pharmaceutical industries to conduct preclinical and clinical proof-of-concept studies on projects originating in both the academic and industrial worlds.

“The CECR funding not only allows us to develop and push through IP-protected targets that are at various stages of development, but also to keep that pipeline of discovery open by developing new targets,” says PC-TRIADD Director Dr. Martin Gleave.

PC-TRIADD has licensed eight drug products so far and spun-off two companies, including OncoGenex, which was named Canadian Biotech company of the year by BIOTECCanada.

Strengthening links between large and small companies

The Quebec Consortium for Drug Discovery (CQDM), a business-led network based in Montreal, is taking a different tact; it has shown three large competitors from the global pharmaceutical industry (Pfizer, AstraZeneca and Merck Frosst) how they can benefit by collaborating on common research platforms that will result in more discoveries, shorter development cycles and safer and more effective drugs. The companies are involved at every level of CQDM, from the board of directors to the scientific advisory committee.

“Our goal is to change the whole innovation cycle of drug development,” says Dr. Max Fehlmann, President and CEO of CQDM. “This is the first time all of the players have found common ground where they can share their concerns and work together. Having the VPs of research from three different companies around the same table working on the same project-it has never happened before.”

A similar paradigm shift is happening in Toronto—Canada’s hotbed of research and innovation—where MaRS Innovation (MI) has become the commercialization agent for intellectual property generated by 14 universities, research hospitals and health centres in the fields of drug development, diagnostic imaging and other medical technologies, ICT, advanced manufacturing and clean technologies.

MI’s CEO, Dr. Rafi Hofstein, says individual institutions often lack the funding and resources needed to advance technologies, file patents, develop business and marketing plans and secure investments. MI is able to offer all that and more, as a one-stop shop for both inventors and investors.

“It all stems from the fact that the government came up with a CECR program,” says Hofstein. “This is probably one of the few commercialization offices globally that has sufficient capital to be able to do things in a robust and useful way.”

Making Research Relevant to Industry & Society

The global economic downturn has affected industrial research spending in many countries —yet Canadian companies continued to increase their cash and in-kind contributions to the Networks of Centres of Excellence (NCE). Industry partners invested \$27.7 million in NCE networks this past year, compared to \$24.8 million in the previous year; \$6.2 million in the Centres of Excellence for Commercialization and Research program (\$3.2 million in 2008-09); and \$6.1 million in four new business-led networks this past year.

“If I had to point to the number one benefit of the NCE, it’s the ability to have industry, government and academia working together to address a clear market need, creating new products and services. That’s how you improve our standard of living and create wealth for Canadians.”

Raymond Leduc, Director of IBM Bromont and PSAB member

The growing private sector support for academic research doesn’t surprise Perrin Beatty, President and CEO of the Canadian Chamber of Commerce and Chair of the NCE’s Private Sector Advisory Board (PSAB). He says the rising cost of research means companies need to collaborate to stay competitive.

“Companies today are so lean that if they are prepared to put up money and staff time, then it says this is something they are serious about because the prospects for success are higher,” says Beatty.

CEO of NCE network MITACS, Dr. Arvind Gupta says it is not enough, however, to push promising ideas out to industry or even to put public funds on the table, and that academia and governments need to show how research links to a company’s bottom line.

“This applies to other partners as well,” says Gupta. “We’ve worked with First Nations communities, for example, to demonstrate how research can help them have better land-use management or contribute to economic development on reserves.”

Engaging Aboriginal Canadians: First Nations communities have been important partners in several NCE successes, including those networks and centres that work on **managing forests, reducing violence among Aboriginal youth and helping Aboriginal women avert diabetes.**

This need to show how scientific research is linked with private sector growth has been echoed by Tom Jenkins, Executive Chair and Chief Strategy Officer for Open Text Corp. and PSAB member.

“The NCE’s networks and centres do this by taking the time to consult with industry and to really engage them,” says Jenkins.

Rarely, however, do just industry and the NCE programs fund networks and centres; academia is also a large contributor, as are research hospitals, NGOs and other public sector organizations.

Beatty says that this kind of collaboration is essential to face the issues critical to Canadians.

“No provincial government, or even the federal government, has the financial resources needed to meet the challenges out there,” says Beatty. “If an institution as large as government can’t do that without partnering with other institutions, where does that leave something the size of a company or an academic institution? Going alone simply isn’t an option anymore.”

The ever-expanding field of digital media, identified as one of Canada’s research and development strengths by the government’s Science, Technology and Innovation Council, is another example of this type of multisectoral collaboration.

The Canadian Digital Media Network (CDMN), a centre launched in 2008, brings together provincial and federal governments, as well as industry heavyweights such as Open Text, Research In Motion and Christie Digital. It acts as a catalyst for greater collaboration between digital media clusters across Canada.

This collaborative approach has piqued the interest of both large and small companies. Jenkins, who also chairs CDMN's advisory board, says it is critical to have all the pieces in the commercialization chain, from the toolmakers through to the tool-users and everyone in between, including venture capitalists who understand the sector.

"Then there's companies like ours that will be interested in licensing ideas or having start-ups acting as a feeder system for our marketing channel," adds Jenkins. "It helps us, but it also gives a small start-up a channel they wouldn't normally have access to."

Since many provinces benefit from the outcomes of NCE research, it is no surprise they are among the largest funding partners. In 2009-10, provincial support increased for most programs: \$19.2 million for networks (from \$7.8 million in 2008-09); \$10 million for centres (from \$11.6 million in 2008-09) and \$6.1 million for the new business-led networks.

Provincial governments and agencies are strategic partners: The Alberta government recently invested \$25 million to support Carbon Management Canada, a NCE network pursuing innovative ways to develop the technologies, the people and the policies to help reach the nation's 2050 reduction targets.

Putting Grad Students to Work on Real-World Problems

The Networks of Centres of Excellence offer some of the country's largest university training programs in applied research. In 2009-10, its core program supported 1,600 graduate and postgraduate students from the natural, social and health sciences and engineering. Leveraged funding from each of the networks made it possible to support a further 1,994 trainees, for a total of 3,594 last year.

Several reports have stated that Canada can increase its productivity and competitiveness by graduating more master's and PhD students, and by having more companies hire these highly-skilled individuals.

These young professionals are building Canada's science and technology (S&T) capacity in critical fields. PrioNet Canada, for example, was established in 2005 with the aim of building a critical mass of Canadian experts able to develop technologies and systems that will help industry and regulators keep BSE or mad cow disease out of Canada.

A decade ago, there was only a handful of researchers in Canada studying prions, or disease-causing proteins. Today, because of PrioNet, there are more than 150 scientists, trainees, students and technicians—of all ages—specializing in prion science.

In the past two years, researchers at PrioNet have linked prion-like proteins to diseases such as Alzheimer's and Parkinson's.

“Because of our efforts to build up Canada's capacity in prion research, we now have the capacity, in light of these more recent discoveries, to work in these human health areas,” says Dr. David Dolphin, Chair of PrioNet.

And that's only part of the story

Canadian companies from all sectors are now reaping even greater benefits from skilled talent within universities. Last year, the Industrial Research and Development Internship (IRDI) program linked nearly 1,000 students with Canadian companies of all sizes to work on leading-edge research applications in their field of expertise.

“I’m hearing first-hand how students are deciding to go for more advanced degrees because of the opportunity to work on issues that are relevant to industry and to society. It also makes them more marketable when looking for a job,” says Dr. Arvind Gupta, CEO of MITACS.

The IRDI program also encourages private sector investment in research and development, and links small companies to universities with larger research capacity. To date, more than 400 companies have taken advantage of the program.

Dr. Sue Abu-Hakima, President and CEO of Amika Mobile Corp., says her company spends one to two years training new employees to be market-ready.

“I’ve spoken with other CEOs who have noticed a drop in the market readiness of graduates in this country, versus other countries like India,” she says. “The NCE, in particular the business-led networks and centres, are well-positioned to reverse this trend.”

Tom Jenkins, Executive Chair and Chief Strategy Officer for Open Text Corp., says he is excited about the training graduate students will receive from CDMN and new NCE, Graphics, Animation and New Media Canada (GRAND).

“You’re talking about students who have a creative arts education, along with computer science and business and marketing experience. That’s a dynamite combination that companies like ours could really benefit from,” says Jenkins.

Dr. Peter Nicholson, Chair of the NCE Selection Committee, is passionate about the importance of building human capital, and describes the NCE’s training of highly qualified people as the program’s greatest contribution to Canadian productivity.

“You need a constant supply of young people who are trained at the leading edge of knowledge,” says Nicholson, former president of the Council of Canadian Academies. “The principal economic purpose of research is to create human capital that will be relevant for the next 30 to 40 years. It’s these people who will act as the receptors for the innovative ideas that are generated worldwide.”

In a survey completed by industry partners who participated in the IRDI program, 96 percent indicated that their company’s research advanced, techniques or tools developed during internships would be used by their organization, and that many internships were directly linked to commercialization of products or processes.

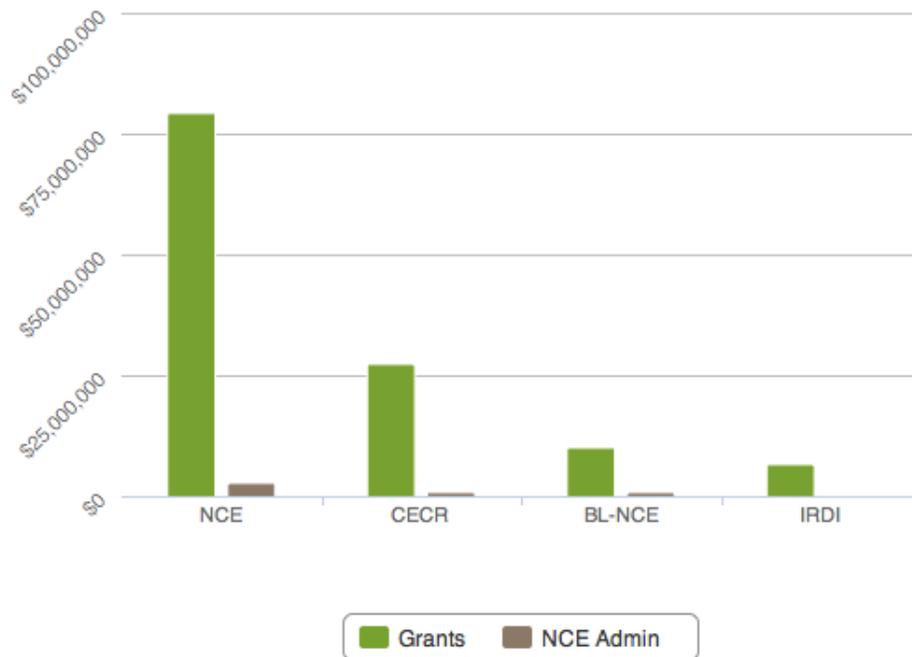
2009-10 Overview

Welcome to the Networks of Centres of Excellence (NCE) Year in Review 2009-10.

For more than 20 years, the NCE programs have evolved to mobilize Canada's best research talent in the academic, private, and public sectors, and to apply it to the task of developing the economy and improving the quality of life of Canadians.

This section illustrates the 2009-10 overall data on all NCE programs.

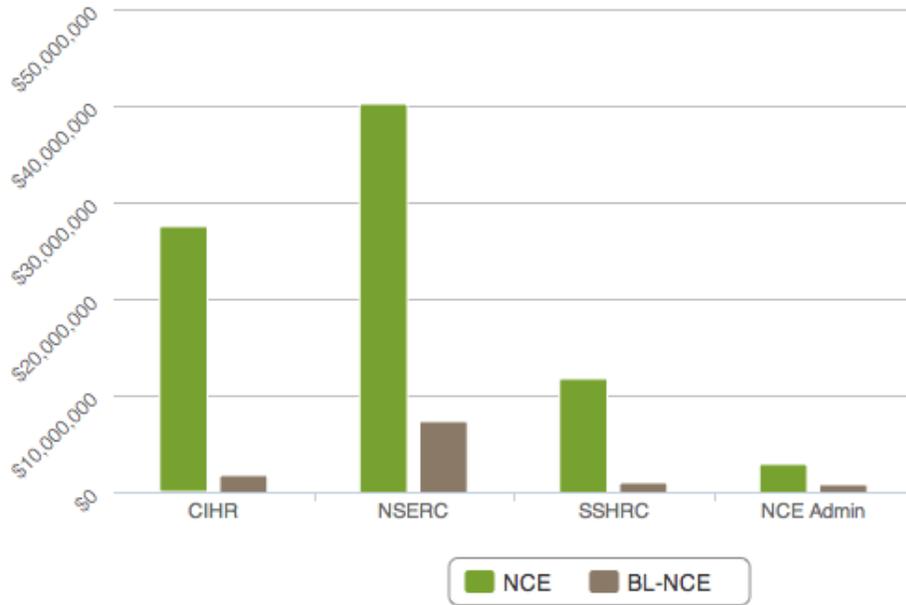
NCE Secretariat Funding



	NCE	CECR	BL-NCE	IRDI	Total
Grants	\$79,500,000	\$27,485,125	\$10,134,750	\$6,880,000	\$123,999,875
NCE Admin	\$2,900,000	\$1,014,875	\$865,250	\$119,875	\$4,900,000
Total	\$82,400,000	\$28,500,000	\$11,000,000	\$6,999,875	\$128,899,875

Program Funding Through Granting Agencies

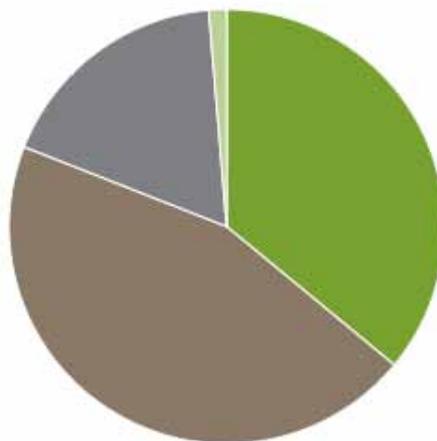
Business-Led Networks Of Centres Of Excellence and Networks Of Centres Of Excellence



Granting Agency	NCE	BL-NCE	Total
CIHR	\$27,500,000	\$1,737,000	\$29,237,000
NSERC	\$40,200,000	\$7,414,750	\$47,614,750
SSHRC	\$11,800,000	\$983,000	\$12,783,000
Grants Total	\$79,500,000	\$10,134,750	\$89,634,750
NCE Admin	\$2,900,000	\$865,250	\$3,765,250
Total	\$82,400,000	\$11,000,000	\$93,400,000

Program Funding Through Granting Agencies

Centres of Excellence for Commercialization and Research



Granting Agency	CECR
CIHR	\$82,396,350
NSERC	\$102,951,010
SSHRC	\$40,524,150
Grants Total	\$225,871,510
NCE Admin	\$3,019,000
Total	\$228,890,510

Paths through which NCE funds flow to the centres 2007-2010

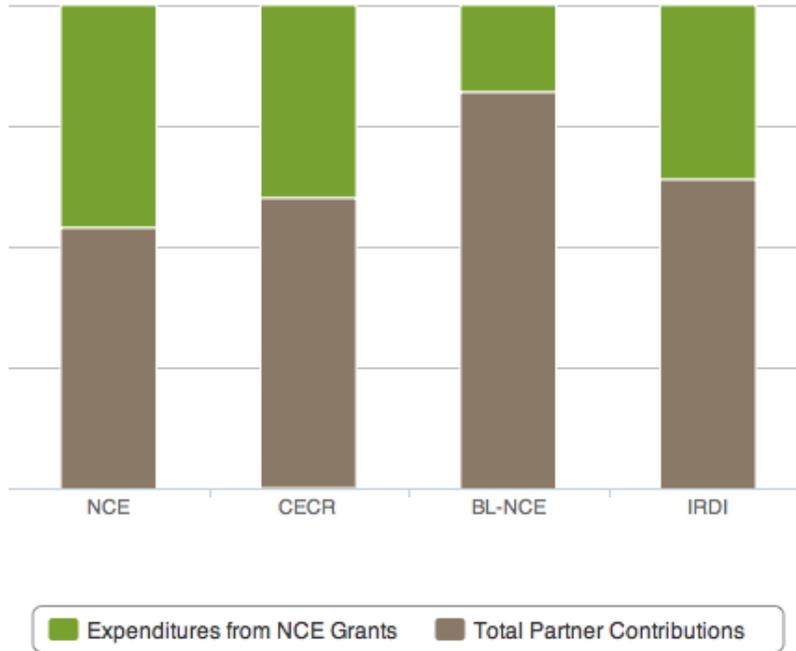
Program Funding Through Granting Agencies

Program Funding Through Granting Agencies

Industrial R&D Internship Program

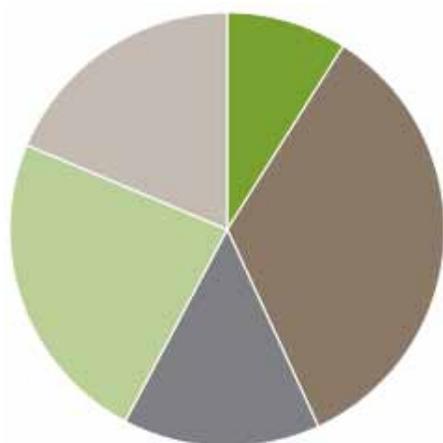
IRDI grants are \$6,880,000 with the NCE Admin at \$119,875.

NCE Partner Contributions



Program	Cash	In-Kind	Total Partner Contributions	Expenditures from NCE Grants
NCE	\$53,373,772	\$28,122,530	\$81,496,302	\$68,348,898
CECR	\$28,686,861	\$10,110,420	\$38,797,281	\$25,810,901
BL-NCE	\$12,109,574	\$6,425,580	\$18,535,154	\$3,993,674
IRDI	\$11,435,750	\$0	\$11,435,750	\$6,301,750

Networks Of Centres Of Excellence (NCE) Program



Partner Contributions



Source	Cash	In-Kind	Total
NCE	\$79,500,000.00		\$79,500,000.00
Partners			
University	\$2,782,119.00	\$4,530,739.00	\$7,312,858.00
Industry	\$18,266,723.30	\$9,553,484.00	\$27,820,207.30
Federal	\$6,600,265.10	\$5,351,165.00	\$11,951,430.10
Provincial	\$17,640,876.00	\$1,585,813.00	\$19,226,689.00
Other	\$8,083,789.00	\$7,101,329.00	\$15,185,118.00
Partner's Total	\$53,373,772.40	\$28,122,530.00	\$81,496,302.40
Grand Total	\$132,873,772.40	\$28,122,530.00	\$160,996,302.40

Networks Of Centres Of Excellence (NCE) Program

Patents, Licences, Publications, Spin-Offs Companies

Patents (NCE by Fiscal Year)	Total
Filed	85
Issued	32
Licenses (NCE by Fiscal Year)	Total
Granted	8
Under negotiation	26
Publications (NCE by Fiscal Year)	Total
Refereed	3466
Non-refereed	2099
*SPIN-OFF COMPANIES	Total
	2

Names of spin off companies for 2009-10

Name	Network	City	Province
Cytognomix	CIPI	London	Ontario
Destin Inc.	SCN	Ottawa	Ontario

Networks Of Centres Of Excellence (NCE) Program

Regional Distribution of Researchers and HQP*

NCE Researchers

	University	Non-University	Total Researchers
Province / Territory			
NWT, Nunavut & Yukon	0	0	0
British Columbia	161	15	176
Alberta	162	2	164
Saskatchewan	17	1	18
Manitoba	28	7	35
Ontario	455	113	568
Québec	233	20	253
New Brunswick	19	0	19
Nova Scotia	38	2	40
Newfoundland and Labrador	14	0	14
Prince Edward Island	1	0	1
Total Canadian	1128	160	1288
Foreign	16	5	21
Grand Total	1144	165	1309

Networks Of Centres Of Excellence (NCE) Program

Regional Distribution of Researchers and HQP*

Highly Qualified Personnel

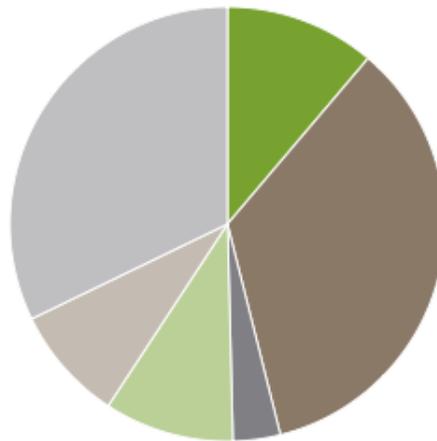
Province / Territory	HQP supported by NCE funds	HQP supported by non-NCE funds	Total HQP	Total Personnel
NWT, Nunavut & Yukon	4	1	5	5
British Columbia	198	260	458	634
Alberta	187	216	403	567
Saskatchewan	30	27	57	75
Manitoba	81	50	131	166
Ontario	636	881	1517	2085
Québec	377	469	846	1099
New Brunswick	14	8	22	41
Nova Scotia	43	60	103	143
Newfoundland and Labrador	30	19	49	63
Prince Edward Island	0	3	3	4
Total Canadian	1600	1994	3594	4882
Foreign	3	2	5	26
Grand Total	1603	1996	3599	4908

* Highly Qualified Personnel refers to research staff such as research associates and technicians, and research trainees such as postdoctoral fellows, graduate students and summer students

Networks Of Centres Of Excellence (NCE) Program

Participating Organizations

Each organization is only counted once, regardless of the number of networks to which it relates.



Networks Of Centres Of Excellence (NCE) Program

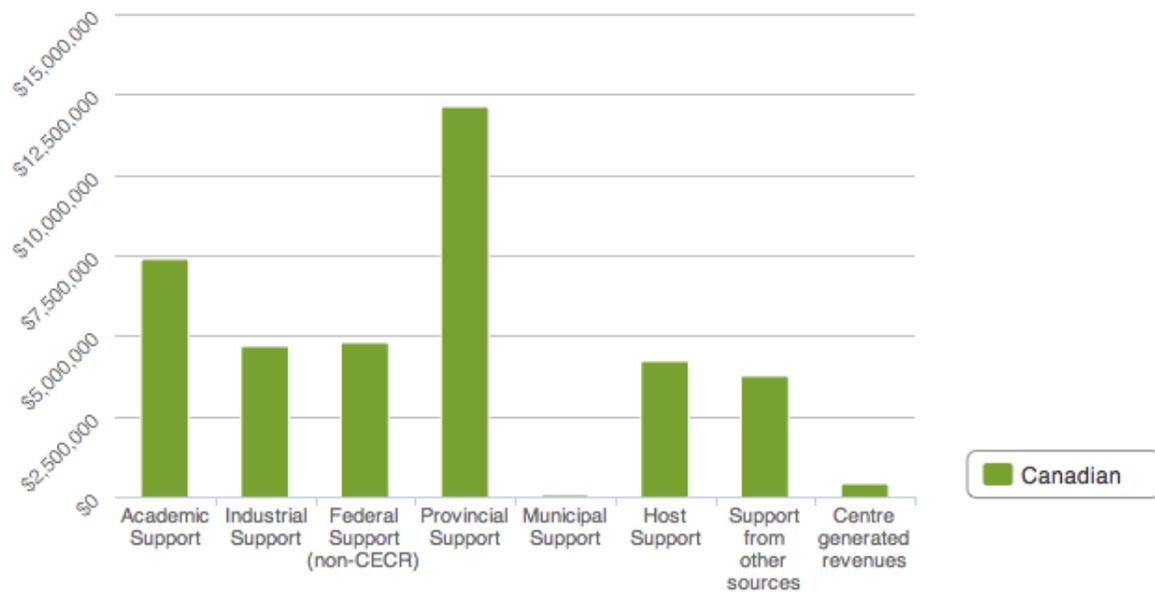
Participating Organizations

Each organization is only counted once, regardless of the number of networks to which it relates.

Province / Territory	University	Company/ Industry	Hospital	Federal	Provincial	Other	Total
NWT, Nunavut & Yukon	0	1	0	5	5	19	30
British Columbia	12	64	4	14	24	68	186
Alberta	6	65	7	7	41	49	175
Saskatchewan	2	4	1	3	5	12	27
Manitoba	4	14	4	9	17	17	65
Ontario	19	294	26	104	38	299	780
Quebec	26	95	19	16	22	68	246
New Brunswick	5	8	0	3	7	8	31
Nova Scotia	6	14	1	3	4	6	34
Newfoundland and Labrador	1	3	0	7	6	7	24
Prince Edward Island	1	1	0	0	1	1	4
Total Canadian	82	563	62	171	170	554	1602
Foreign	141	132	8	21	1	87	390
Total	223	695	70	192	171	641	1992

Centres of Excellence for Commercialization and Research (CECR) Program

Partner Contributions by Type



Centres of Excellence for Commercialization and Research (CECR) Program

Partner Contributions by Type

Source	Cash	In-Kind	Total
2009			
Canadian			
Academic Support	\$3,588,222	\$3,798,017	\$7,386,239
Industrial Support	\$1,888,893	\$2,819,726	\$4,708,619
Federal Support (non-CECR)	\$4,798,256	\$1,500	\$4,799,756
Provincial Support	\$12,112,429	\$30,167	\$12,142,596
Municipal Support	\$50,000	\$48,756	\$98,756
Host Support	\$2,362,909	\$1,849,036	\$4,211,945
Support from other sources	\$3,264,712	\$537,732	\$3,802,444
Centre generated revenues	\$413,389	\$0	\$413,389
Total Canadian	\$28,478,810	\$9,084,934	\$37,563,744
International			
Industrial Support	\$108,818	\$964,638	\$1,073,456
Support from other sources	\$99,233	\$60,848	\$160,081
Total International	\$208,051	\$1,025,486	\$1,233,537
Total	\$28,686,861	\$10,110,420	\$38,797,281

Centres of Excellence for Commercialization and Research (CECR) Program

Partner Contributions by Province and International

Totals

	Total
British Columbia	\$13,069,195
Prairies	\$1,061,146
Ontario	\$19,655,236
Québec	\$3,706,487
Atlantic	\$71,680
International	\$1,233,537
Total	\$38,797,281

Centres of Excellence for Commercialization and Research (CECR) Program

Partner Contributions by Province and International

By Category

	Academic Support	Industrial Support	Host Support
British Columbia	\$614,854	\$100,236	\$2,489,114
Prairies	\$491,449	\$9,600	
Ontario	\$5,396,389	\$2,018,649	\$1,557,293
Québec	\$820,467	\$2,571,534	\$165,538
Atlantic	\$63,080	\$8,600	
International	\$2,975	\$1,073,456	
Total	\$7,389,214	\$5,782,075	\$4,211,945

Centres of Excellence for Commercialization and Research (CECR) Program

Partner Contributions by Province and International

By Category

	Municipal Support	Federal Support (non-CECR)	Provincial Support
British Columbia		\$155,344	\$7,859,301
Prairies			\$459,452
Ontario	\$48,756	\$4,644,412	\$3,823,843
Québec	\$50,000		
Atlantic			
International			
Total	\$98,756	\$4,799,756	\$12,142,596

Centres of Excellence for Commercialization and Research (CECR) Program

Partner Contributions by Province and International

By Category

	Support from other sources	Centre generated revenues
British Columbia	\$1,850,346	
Prairies	\$7,350	\$93,295
Ontario	\$1,845,800	\$320,094
Québec	\$98,948	
Atlantic		
International	\$157,106	
Total	\$3,959,550	\$413,389

Centres of Excellence for Commercialization and Research (CECR) Program

Partner Contributions by Province and International

By Category

	NCE funding over 5 years
British Columbia	\$66,399,060
Prairies	\$26,640,575
Ontario	\$94,448,300
Québec	\$38,383,575
Atlantic	\$0
International	\$0
Total	\$225,871,510

Centres of Excellence for Commercialization and Research (CECR) Program

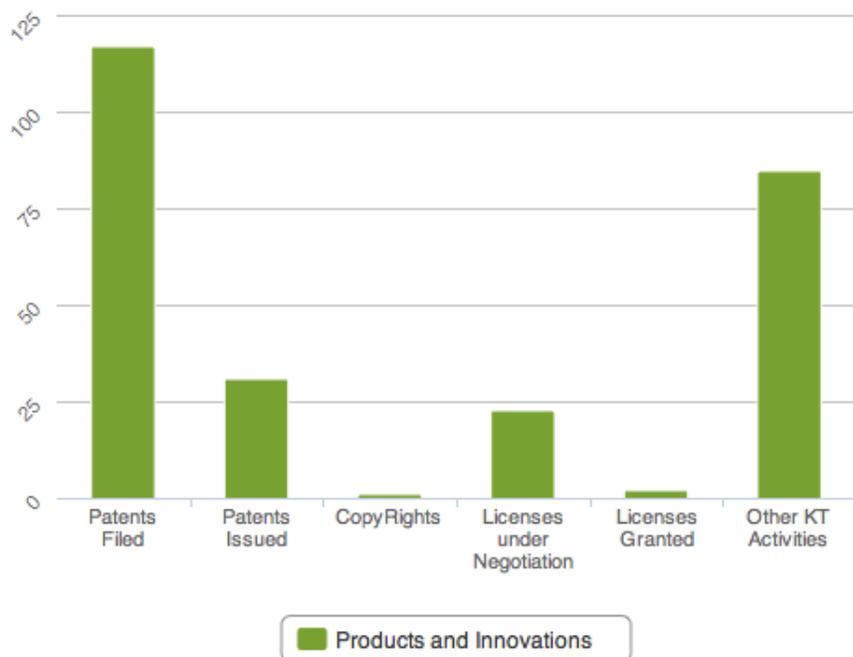
Centres Participating Organizations

	Academic Support	Host Support	Support from other sources	Centre generated revenues	Industrial Support	Federal Support (nonCECR)	Provincial Support	Municipal Support	Total
British Columbia	8	4	13	0	10	2	3	0	40
Prairies	1	0	1	2	1	0	1	0	6
Ontario	26	7	8	4	31	7	9	1	93
Québec	2	1	4	0	10	0	0	1	18
Atlantic	1	0	0	0	1	0	0	0	2
International	1	0	9	0	15	0	0	0	25
Total	39	12	35	6	68	9	13	2	184

Centres of Excellence for Commercialization and Research (CECR) Program

Knowledge Translation Activities

Fiscal Year: 2009-2010



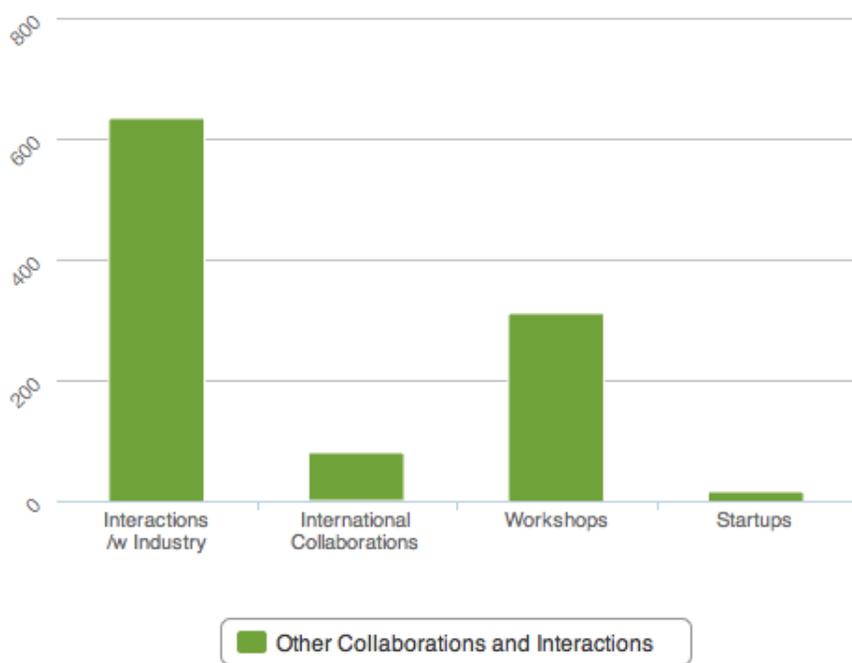
Products and Innovations

Patents Filed	Patents Issued	CopyRights	Licenses under Negotiation	Licenses Granted	Other KT Activities
117	31	1	23	2	85

Centres of Excellence for Commercialization and Research (CECR) Program

Knowledge Translation Activities

Fiscal Year: 2009-2010



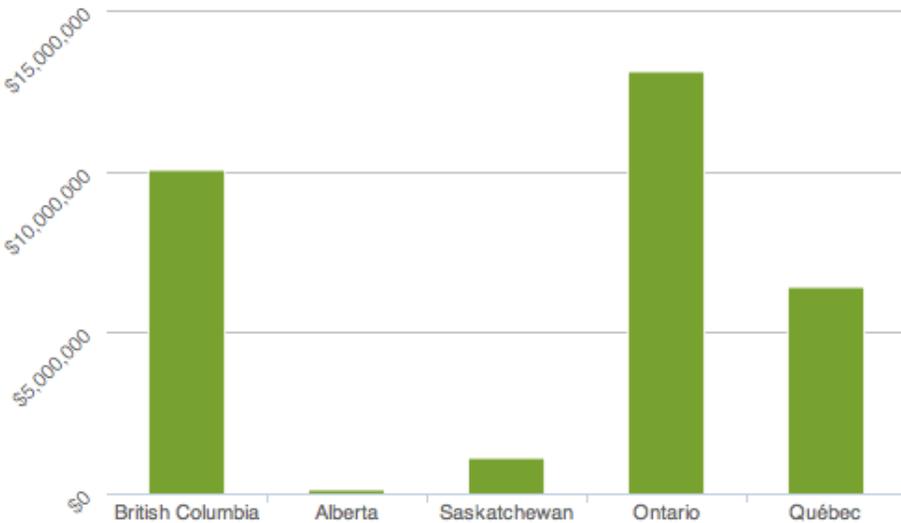
Other Collaborations and Interactions

Interactions / w Industry	International Collaborations	Workshops	Startups
635	80	312	17

Centres of Excellence for Commercialization and Research (CECR) Program

Centre Expenditures by Province

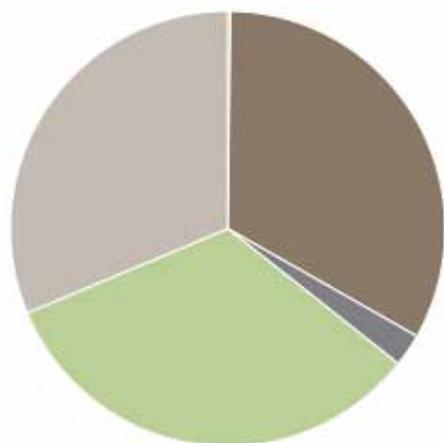
Centre Expenditures by Province



Fiscal Year: 2010 - Total Expenditures

Province	Commercialization	Knowledge Translation and Operations	Total
British Columbia	\$1,054,585	\$8,984,659	\$10,039,244
Alberta	\$0	\$145,904	\$145,904
Saskatchewan	\$162,860	\$962,524	\$1,125,384
Ontario	\$4,342,199	\$8,793,969	\$13,136,168
Québec	\$20,242	\$6,399,885	\$6,420,127
Total	\$5,579,886	\$25,286,941	\$30,866,827

Business-Led Networks Of Centres Of Excellence (BL-NCE)



Partner Contributions

Fiscal Year 2009-2010

■ University
 ■ Industry
 ■ Federal
 ■ Provincial
 ■ Other

Source	Cash	In-Kind	Total
BL-NCE	\$10,134,750		\$10,134,750
Partners			
University	\$0	\$37,400	\$37,400
Industry	\$4,308,429	\$1,812,360	\$6,120,789
Federal	\$450,000	\$0	\$450,000
Provincial	\$6,090,000	\$31,940	\$6,121,940
Other	\$1,261,145	\$4,543,880	\$5,805,025
Partner's Total	\$12,109,574	\$6,425,580	\$18,535,154
Grand Total	\$22,244,324	\$6,425,580	\$28,669,904

Business-Led Networks Of Centres Of Excellence (BL-NCE)

Publications and Specialized Training Opportunities

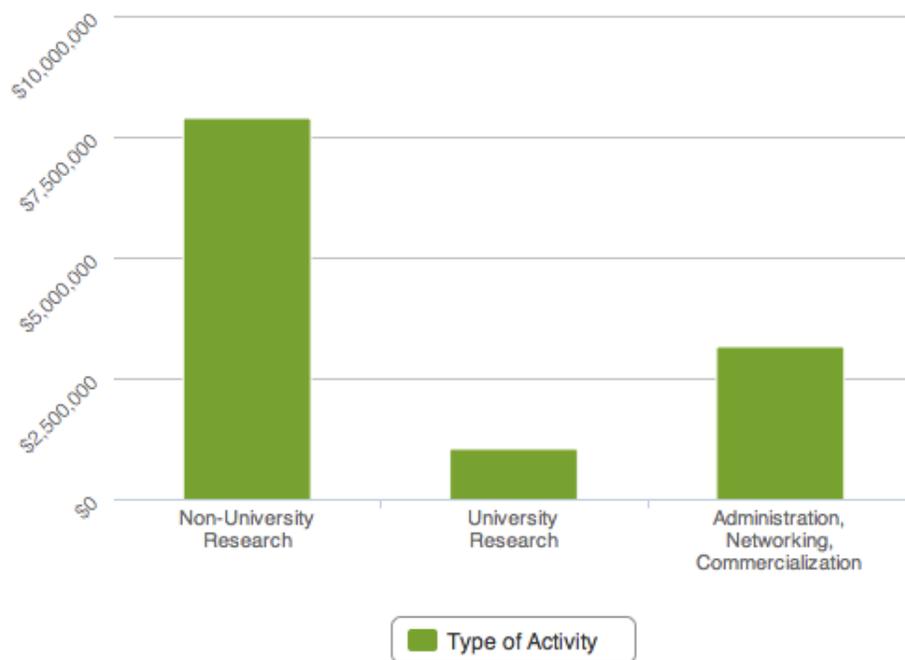
Fiscal Year 2009-2010

Contributions	Number
Refereed Contributions	27
Non-refereed contributions	17
Specialized Publications	3
Total All Publications	47
Number of specialized training opportunities created	24

Business-Led Networks Of Centres Of Excellence (BL-NCE)

University and Private Sector Expenditures

Fiscal Year 2009-2010



Business-Led Networks Of Centres Of Excellence (BL-NCE)

University and Private Sector Expenditures

Fiscal Year 2009-2010

	Expenditures Using BL-NCE Funds	Expenditures Using Matching Funds	Total Expenditures
Non-University Research	\$1,929,408	\$5,969,206	\$7,898,614
University Research	\$517,133	\$534,070	\$1,051,203
Administration, Networking, Commercialization	\$1,547,133	\$1,617,028	\$3,164,161
Total	\$3,993,674	\$8,120,304	\$12,113,978

Business-Led Networks Of Centres Of Excellence (BL-NCE)

Supported Researchers

Fiscal Year 2009-2010

BL-NCE Researchers	Total
University	8
Non-University	21
Total Researchers	29
Highly Qualified Personnel	
HQP supported by BL-NCE funds	10
HQP supported by non-BL-NCE funds	10
Total HQP	20
Total Personnel	49

* Highly Qualified Personnel refers to research staff such as research associates and technicians, and research trainees such as postdoctoral fellows, graduate students and summer students

Business-Led Networks Of Centres Of Excellence (BL-NCE)

BL-NCE Participating Organizations

Fiscal Year 2009-2010

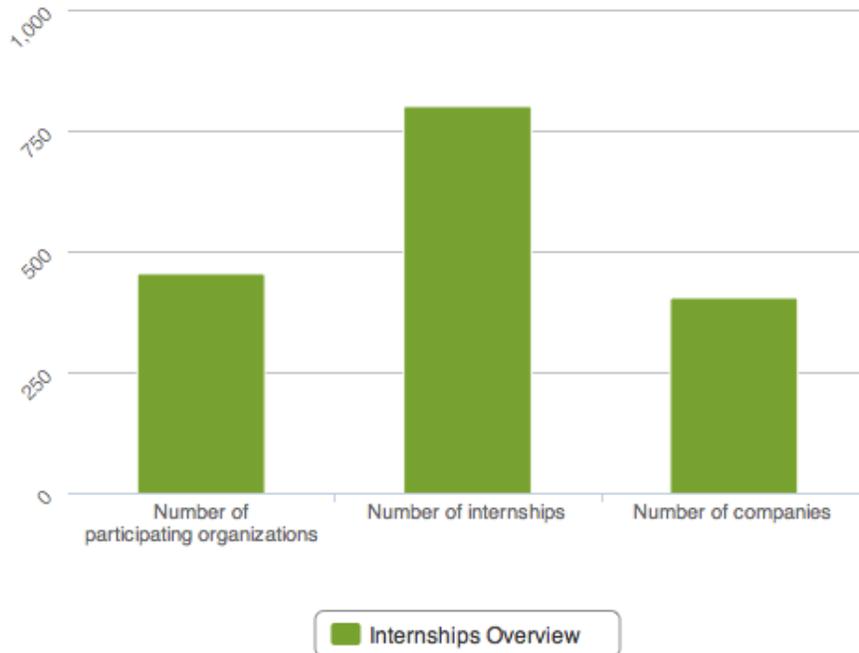
Province / Territory	University	Industry	Federal	Provincial	Other	Total
Northwest Territories, Nunavut & Yukon	0	0	0	0	0	0
British Columbia	1	0	0	0	0	1
Alberta	2	12	2	1	0	17
Saskatchewan	1	0	1	2	1	5
Manitoba	0	1	0	0	0	1
Ontario	4	3	3	0	1	11
Québec	8	13	0	4	4	29
New Brunswick	0	0	0	0	0	0
Nova Scotia	0	0	0	0	0	0
Newfoundland and Labrador	0	0	0	0	0	0
Prince Edward Island	0	0	0	0	0	0
Province & Territory Total	16	29	6	7	6	64
Foreign	0	4	0	0	0	4
Grand Total	16	33	6	7	6	68

Industrial R&D Internship Program (IRDI)

Grant

Award \$6.88M annually

Internships Overview



Internships Overview

Total

Number of participating organizations

455

Number of internships

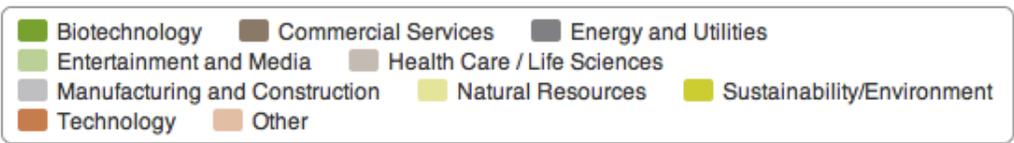
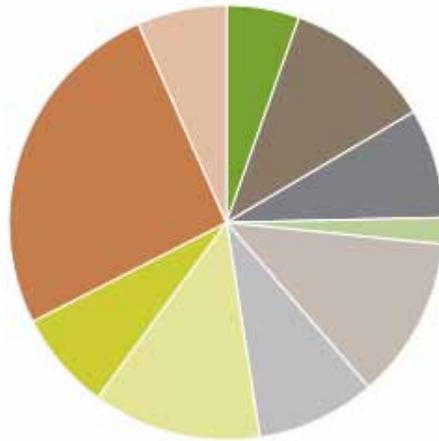
801

Number of companies

406

Industrial R&D Internship Program (IRDI)

Companies By Sector



Industrial R&D Internship Program (IRDI)

Companies By Sector

Sector	Total
Biotechnology	22
Commercial Services	45
Energy & Utilities	33
Entertainment & Media	8
Health Care / Life Sciences	49
Manufacturing & Construction	36
Natural Resources	51
Sustainability / Environment	30
Technology	105
Other	27
Total	406

Networks & Centres By Sector

Biotechnology

Advanced Applied Physics Solutions Inc. - AAPS (2008-13)

Focus:

To commercialize advanced physics technologies for the social and economic well-being of Canadians, and to advance the development of physics applications for the benefit of people around the world.

Funding:

\$14,955,575 for entire funding period

Strength:

Four patents filed

Partnership Power:

\$505,859 in in-kind support

Web site:

www.aapsinc.com

Advanced Foods and Materials Network - AFMNet (2003-11)

Focus:

To identify strategic foods and biomaterials opportunities and network outstanding researchers to capture and facilitate them.

Funding:

\$38,886,000 for entire funding period

Strength:

33 researchers and 88 highly qualified personnel

Partnership Power:

195 industry, public service and academic partners

Scientific Director:

Dr. Rickey Yada

Web site:

www.afmnet.ca

**Centre for Drug Research
and Development - CDRD
(2008-13)**

Focus:

To improve the health of Canadians by advancing promising discoveries to a commercially attractive stage and to build a collaborative research infrastructure to increase research and development capacity in the life sciences in British Columbia.

Funding:

\$14,955,575 for entire funding period

Strength:

Five patents filed

Partnership Power:

\$15,285,359 in cash and in-kind support

Web site:

www.cdrd.ca

**Centre for Probe Development and
Commercialization - CPDC
(2008-13)**

Focus:

To revolutionize health care by focusing on all areas related to the development of molecular imaging probes — chemical compounds that provide a non-invasive means to diagnose disease at its earliest stage.

Funding:

\$14,955,575 for entire funding period

Partnership Power:

\$1,983,292 in cash and in-kind support

Web site:

www.imagingprobes.ca

**MaRS Innovation - MI
(2008-13)**

Focus:

To put Canada on the global innovation stage, by better connecting research with industry and strengthening Canada's competitive capacity in knowledge-based businesses - in short, to launch a new generation of robust, high-growth Canadian companies that will become global market leaders.

Funding:

\$14,955,575 for entire funding period

Strength:

18 patents filed

Partnership Power:

\$2,138,893 in cash and in-kind support

Web site:

www.marsdd.ca

**Pan-Provincial Vaccine
Enterprise - PREVENT
2008-13)**

Focus:

To bridge a vaccine commercialization gap to accelerate the rate at which essential vaccines reach Canadians.

Funding:

\$14,955,575 for entire funding period
Partnership

Power:

\$718,666 in cash and in-kind support

Web site:

www.prevent-cecr.ca

**Quebec Consortium for
Drug Discovery - CQDM
(2009-13)**

Focus:

To accelerate the drug discovery process and to develop safer and more effective drugs.

Funding:

\$8,000,000 for entire funding period

Partnership Power:

\$7,000,000 in partner cash

Network Director:

Dr. Max Fehlmann

Web site:

www.cqdm.org

**Stem Cell Network - SCN
(2001-12)**

Focus:

To be a catalyst for enabling translation of stem cell research into clinical applications, commercial products or public policy.

Funding:

\$63,619,000 for entire funding period

Strength:

102 researchers and 450 highly qualified personnel

Partnership Power:

212 industry, public service and academic partners

Scientific Director:

Dr. Michael Rudnicki

Web site:

www.stemcellnetwork.ca

The Prostate Centre's Translational Research Initiative for Accelerated Discovery and Development - PC-TRIADD (2008-13)

Focus:

To foster the paradigm of team-driven translational health research to discover molecular mechanisms of cancer progression and therapeutic resistance, and to use this information to develop new services and products that reduce suffering, improve survival for patients with cancer and promote regional growth of biotechnology.

Funding:

\$14,955,575 for entire funding period

Strength:

73 patents filed

Partnership Power:

\$1,182,797 in cash and in-kind support

Web site:

www.prostatecentre.com

Health

Allergy, Genes and Environment Network - AllerGen (2004-12)

Focus:

To catalyze and support discovery, development, networking, capacity building, commercialization and knowledge translation to reduce the burden of allergic and related immune diseases.

Funding:

\$37,842,500 for entire funding period

Strength:

45 researchers and 119 highly qualified personnel

Partnership Power:

197 industry, public service and academic partners

Scientific Director and CEO:

Dr. Judah Denburg

Web site:

www.allergen-nce.ca

**Canadian Arthritis Network - CAN
(1999-2012)**

Focus:

To improve the quality of life of people with arthritis, decrease the personal, societal and economic burden of the disease and promote the growth of the Canadian economy through arthritis R&D.

Funding:

\$54,709,000 for entire funding period

Strength:

121 researchers and 516 highly qualified personnel

Partnership Power:

129 industry, public service and academic partners

Scientific Directors:

Dr. Claire Bombardier and
Dr. Monique Gignac

Web site:

www.arthritisnetwork.ca

**Canadian Obesity Network - CON
(2005-10)**

Focus:

To reduce the burden of obesity on Canadians by linking obesity researchers with health professionals, policy makers and other stakeholders to foster knowledge translation, capacity building and partnerships.

Funding:

\$2,000,000 for entire funding period

Partnership Power:

122 industry, public service and academic partners

Scientific Director:

Dr. Arya M. Sharma

Web site:

www.obesitynetwork.ca

**Canadian Stroke Network - CSN
(2000-13)**

Focus:

To reduce the burden of stroke through leadership in research innovation.

Funding:

\$77,700,000 for entire funding period

Strength:

35 researchers and 85 highly qualified personnel

Partnership Power:

72 industry, public service and academic partners

Scientific Director and CEO:

Dr. Antoine Hakim

Web site:

www.canadianstrokenetwork.ca

**Centre of Excellence for the Prevention
of Organ Failure - PROOF
(2008-13)**

Focus:

To discover, develop and commercialize biological markers (biomarkers) to diagnose, prevent and treat heart, lung and kidney failure.

Funding:

\$14,955,575 for entire funding period

Partnership Power:

\$2,528,823 in cash and in-kind support

Web site:

www.proof.icapture.ubc.ca

**Centre of Excellence in
Personalized Medicine - CEPMed
(2008-13)**

Focus:

To contribute actively to the development of personalized medicine in Canada through educational initiatives and by financing public/private partnership innovative projects in cutting edge technology platforms.

Funding:

\$13,805,000 for entire funding period

Partnership Power:

\$1,800,000 in cash and in-kind support

Web site:

www.cepmed.com

**Centre for Surgical Invention
and Innovation - CSII
(2009-14)**

Focus:

To develop and commercialize a new class of robotic platforms for targeted, less invasive surgical and medical interventions. These innovations seek to dramatically improve patient outcomes, reduce the length of hospital stays and recovery periods, and allow patients to return to full activity following major procedures far more quickly than conventional procedures.

Funding:

\$14,805,000 for entire funding period

Strength

Six patents filed

Partnership Power:

\$1,221,600 in cash and in-kind support

Web site:

www.csii.ca

Institute for Research in Immunology and Cancer - Commercialization of Research - IRICoR (2008-13)

Focus:

To contribute significantly to the advancement of health research by shedding light on the workings of the immune system and the causes of cancer, to provide exceptional training to investigators in-the-making, and to develop therapies to stop the suffering and premature death caused by cancer.

Funding:

\$14,955,575 for entire funding period

Strength

Three patents filed

Partnership Power:

\$818,433 in cash and in-kind support

Web site:

www.iricor.ca

National Initiative for the Care of the Elderly - NICE (2005-10)

Focus:

To help close the gap between evidence-based research and actual practice, improve the training of existing practitioners, geriatric educational curricula, and interest new students in specializing in geriatric care, and to effect positive policy changes for the care of older adults.

Funding:

\$2,160,000 for entire funding period

Partnership Power:

120 industry, public service and academic partners

Scientific Director:

Dr. Lynn McDonald

Web site:

www.nicenet.ca

**NeuroDevNet
(2009-14)**

Focus:

To understand the causes of neurological deficits, to train a new generation of researchers and to translate new knowledge into improved measurement, diagnosis, prevention and treatment of neurodevelopmental disorders.

Funding:

\$19,572,000 for entire funding period

Strength:

One highly qualified personnel

Partnership Power:

65 industry, public service and academic partners

Scientific Director:

Dr. Daniel Goldowitz

**PrioNet Canada
(2005-12)**

Focus:

To lead the generation, application and commercialization of mathematical tools and methodologies within a world-class research program.

Funding:

\$35,796,000 for entire funding period

Strength:

81 researchers and 118 highly qualified personnel

Partnership Power:

89 industry, public service and academic partners

Scientific Director:

Dr. Neil Cashman

Web site:

www.prionetcanada.ca

Information Communication Technologies

Canadian Digital Media Network (formerly Corridor for Advancing Canadian Digital Media) - CDMN (2009-14)

Focus:

To use digital media tools, technology and applications to advance multiple industries - entertainment, health care, education, financial services, and advanced manufacturing.

Funding:

\$10,721,000 for entire funding period

Web site:

www.cdmn.ca

Canadian Institute for Photonic Innovations - CIPI (1999-2012)

Focus:

To stimulate innovations in photonics and promote their exploitation to generate wealth and enhance the quality of life for Canadians.

Funding:

\$52,534,900 for entire funding period

Strength:

101 researchers and 214 highly qualified personnel

Partnership Power:

132 industry, public service and academic partners

Scientific Director:

Dr. Robert Fedosejevs

Web site:

www.cipi.ulaval.ca

**Geomatics for Informed
DEcisions Network - GEOIDE
(1999-2012)**

Focus:

To consolidate and strengthen the domestic geomatics industry while making optimum use of R&D resources, and to create a sustainable network that integrates all sectors of the geomatics community.

Funding:

\$45,419,000 for entire funding period

Strength:

118 researchers and 196 highly qualified personnel

Partnership Power:

244 industry, public service and academic partners

Scientific Director:

Dr. Nicholas Chrisman

Web site:

www.geoide.ulaval.ca

**Graphics, Animation and
New Media Canada - GRAND
(2009-14)**

Focus:

To understand the underlying technologies of new media, animation, and games and to make selective advances in a coordinated, multidisciplinary setting that lead to social, legal, economic, and cultural benefits for Canadians.

Funding:

\$23,250,000 for entire funding period

Partnership Power:

37 industry, public service and academic partners

Scientific Director:

Dr. Kellogg S. Booth

Intelligent Sensing for Innovative Structures - ISIS (1995-2011)

Focus:

To advance Canadian civil engineering to a world leadership position through the development and application of fibre reinforced polymers and fibre optic sensor technologies.

Funding:

\$40,350,000 for entire funding period

Strength:

40 researchers and 142 highly qualified personnel

Partnership Power:

38 industry, public service and academic partners

Scientific Director and President:

Dr. Aftab Mufti

Web site:

www.isiscanada.ca

Mathematics of Information Technology and Complex Systems - MITACS (1999-2012)

Focus:

To lead the generation, application and commercialization of mathematical tools and methodologies within a world-class research program.

Funding:

\$64,030,000 for entire funding period

Strength:

322 researchers and 795 highly qualified personnel

Partnership Power:

309 industry, public service and academic partners

Scientific Director and CEO:

Dr. Arvind Gupta

Web site:

www.mitacs.ca

Environment

ArcticNet (2003-11)

Focus:

To translate our growing understanding of the changing Arctic into impact assessments, national policies and adaptation strategies.

Funding:

\$45,870,000 for entire funding period

Strength:

36 researchers and 257 highly qualified personnel

Partnership Power:

199 industry, public service and academic partners

Scientific Director:

Dr. Louis Fortier

Web site:

www.arcticnet.ulaval.ca

Canadian Water Network - CWN (2001-12)

Focus:

To establish and nurture partnerships and communities of practice that bring together multidisciplinary research excellence and water managers providing innovation and highly qualified people to address water resource management.

Funding:

\$46,000,000

Strength:

28 researchers and 150 highly qualified personnel

Partnership Power:

179 industry, public service and academic partners

Scientific Director:

Dr. Mark Servos

Web site:

www.cwn-rce.ca

**Carbon Management Canada
– CMC-NCE
(2009-14)**

Focus:

To develop innovative technologies and processes to reduce carbon emissions from the recovery and use of Canada's fossil fuels – coal, oil and natural gas – in order to maintain access to markets, meet global energy demand and respond to climate change.

Funding:

\$25,000,000 for entire funding period

Partnership Power:

Nine industry, public service and academic partners

Scientific Director:

Dr. Steve Larter

**Green Aviation Research and
Development Network - GARDN
(2009-13)**

Focus:

To promote aerospace technologies for the protection of the environment

Funding:

\$11,819,473 for entire funding period

Partnership Power:

\$5,623,589 in cash and in-kind contribution

Network Director:

Mr. Sylvain Cofsky

Web site:

www.gardn.org

**GreenCentre Canada - GCC
(2009-14)**

Focus:

To transform green chemistry research breakthroughs into clean, sustainable products and processes that will benefit Canada and the world.

Funding:

\$9,100,000 for entire funding period

Strength

Eight patents filed

Partnership Power:

\$1,082,397 in cash and in-kind support

Web site:

www.greencentrecanada.ca

**Oceans Network Canada Centre for
Enterprise and Engagement - ONCCEE
(2009-14)**

Focus:

To position Canada as an international leader in the science and technology of ocean observation systems and to maximize the associated economic and social benefits through innovative commercialization and outreach programs.

Funding:

\$6,576,760 for entire funding period

Partnership Power:

\$315,873 in cash support

Web site:

www.oceannetworks.ca

Natural Resources

Sustainable Forest Management Network - SFM (1995-2010)

Focus:

To enable industry and government partners to develop strategies and tools to sustain Canada's forests.

Funding:

\$49,040,000 for entire funding period

Strength:

24 researchers and 83 highly qualified personnel

Partnership Power:

89 industry, public service and academic partners

Scientific Director:

Dr. James Fyles

Web site:

www.sfmnetwork.ca

Bioindustrial Innovation Centre- BIC (2008-13)

Focus:

To help Canada become a globally recognized leader in taking sustainable feedstock, such as agricultural and forestry by-products and wastes, and turning these renewable resources into energy and value-added chemicals for use in applications ranging from construction to automotive parts.

Funding:

\$14,955,575 for entire funding period

Partnership Power:

\$318,959 in in-kind support

Web site:

www.bicsarnia.ca

**Centre of Excellence in
Energy Efficiency - C3E
(2009-14)**

Focus:

To create an integrated vehicle for economic development in energy efficiency and new energy technologies.

Funding:

\$9,623,000 for entire funding period

Partnership Power:

\$547,922 in cash and in-kind support

Web site:

www.ceee.ca

**Canadian Forest NanoProducts
Network - ArboraNano
(2009-13)**

Focus:

To develop a new Canadian bio-economy based on sustainable, innovative, highly-engineered, nanotechnology-based carbon-neutral products created from Canada's vast forest resource.

Funding:

\$8,991,000 for entire funding period

Partnership Power:

\$842,645 in cash and in-kind contribution

Network Director:

Dr. Reinhold (Ron) Crotogino

Web site:

www.arboranano.ca

**Sustainable Technologies for Energy
Production Systems - STEPS
(2009-13)**

Focus:

To address hydrocarbon energy production sustainability challenges, ensuring a secure and affordable supply of clean energy for Canadians.

Funding:

\$10,500,000 for entire funding period

Partnership Power:

\$5,068,920 in cash and in-kind contribution

Network Director:

Dr. Malcolm Wilson

Web site:

www.ptrc.ca

**Tecterra (formerly Centre of Excellence
for Integrated Resource Management)
(2009-14)**

Focus:

To develop intelligent, integrated resource management tools to observe, monitor, forecast and manage Alberta's land and natural resources.

Funding:

\$11,685,000 for entire funding period

Partnership Power:

\$477,641 in cash support

Web site:

www.tecterra.com

Other

AUTO21 Network of Centres of Excellence - Auto21 (2001-12)

Focus:

To help build a stronger automotive sector in Canada through excellence in public/private sector collaborative research and the development of human and social capital

Funding:

\$63,713,000 for entire funding period

Strength:

223 researchers and 386 highly qualified personnel

Partnership Power:

225 industry, public service and academic partners

Scientific Director and CEO:

Dr. Peter Frise

Web site:

www.auto21.ca

Centre for the Commercialization of Research - CCR (2008-13)

Focus:

To generate economic benefits for Canada through the successful commercialization of new technologies and knowledge by helping high-potential technology-based companies to build the capacity to become sustainable global competitors.

Funding:

\$14,955,575 for entire funding period

Partnership Power:

\$4,555,300 in cash and in-kind support

Web site:

www.occ-ontario.org/Pages/COEResearch.aspx

**Promoting Relationships and Eliminating
Violence Network - PREVNet
(2005-10)**

Focus:

To develop a national strategy to reduce problems of bullying and victimization throughout Canada.

Funding:

\$2,000,000 for entire funding period

Partnership Power:

88 industry, public service and academic partners

Scientific Co-Directors:

Dr. Wendy Craig and Dr. Debra Pepler

Web site:

www.prevnet.ca

COMMITTEES

Steering Committee

The NCE programs are overseen by a tri-agency NCE Steering Committee made up of the deputy minister of industry (or delegate), the presidents of the three granting agencies, the Natural Sciences and Engineering Research Council (NSERC), the Canadian Institutes of Health Research (CIHR), and the Social Sciences and Humanities Research Council (SSHRC), and the president of the Canadian Foundation for Innovation (CFI) (as an observer).

Suzanne Fortier

President
Natural Sciences and Engineering Research Council

Official Members

Alain Beaudet

President
Canadian Institutes of
Health Research

Richard Dicerni

Deputy Minister
Industry Canada

Chad Gaffield

President
Social Sciences and Humanities
Research Council

Eliot A. Phillipson*

President and CEO
Canada Foundation for
Innovation

* Non-voting ex-officio member

Private Sector Advisory Board

The Private Sector Advisory Board (PSAB) is a body of trusted, seasoned, strategic advisors comprised of respected Canadian industry leaders. PSAB was established by the Networks of Centres of Excellence by request of the Government of Canada in 2007.

The Honourable Perrin Beatty

President and Chief Executive Officer
Canadian Chamber of Commerce

Members

Suhayya (Sue) Abu-Hakima

Co-Founder, President /CEO
Amika Mobile Corporation

Patrick Champagne

Vice-président, ingénierie
Esterlin e/CMC Electronics Inc.

Haig deB Farris

President
Fractal Capital Corporation

Keith Stoodley

Senior Vice-President
of Marketing
Provincial Aerospace Ltd

Raymond Leduc

Chief Director –
Bromont Plant
IBM Canada Ltée

John MacDonald

Chairman and CEO
Day4Energy

Kevin O'Brien Fehr

Director, R&D Alliances
GlaxoSmithKline Inc.

Jeffrey Turner

President and CEO
Defyrus IncFred

A. Hemphill

Former Vice-president,
Technology Project
Development
and Research Syncrude
Canada Ltd

Donald Lush

President
Environmental Bio-detection
Products Inc.

COMMITTEES

Management Committee

The NCE Management Committee is a coordinating mechanism composed of a representative at the vice-president director general level from each of the three granting councils and Industry Canada, as well as the associate vice-president of the NCE program and the director of Policy and International Relations Division at NSERC.

It is chaired by the NSERC vice-president of the Research Partnerships Program. The NCE Management Committee oversees the operation and coordination of the program administration, communications and evaluation functions. The Committee reports to the NCE Steering Committee and refers policy matters, and those administrative issues in which there is no consensus, to the NCE Steering Committee.

Members

Karen Corkery

Director General
Portfolio and Coordination
Branch Industry Canada

Gisèle Yasmeen

Vice-President
Partnerships Branch
SSHRC

Janet Walden, Chair

Vice-President
Research Partnerships Programs
NSERC

Jean-Claude Gavrel

Associate Vice-President
Networks of Centres
of Excellence

Ian Graham

Vice-President
Knowledge Translation
CIHR

Danielle Ménard

Director
Policy and International
Relations Division
NSERC

Innovation Impacts

Innovation is the driving force towards lasting sustainable prosperity in the coming decades. Advancing both Canada's research and development and its capacity to commercialize research is the cornerstone of the federal science and technology (S&T) strategy, and the mission of the Networks of Centres of Excellence (NCE).

The NCE has met this challenge head-on by mobilizing the best and brightest from across the private, public and academic sectors in Canada to collectively address several of the most pressing environmental, health, economic and social issues.

Building Canada's Strengths

Information and communications technology (ICT) is one of Canada's strongest points in research and development. From cutting-edge collaboration in digital media to advances in medical technologies and diagnostic tools, Canada continues to build a strong international reputation pioneering at the frontlines of new technologies that improve the quality of life of Canadians.

Improving the Health of Canadians

Fostering novel collaborations among Canada's leading health scientists brings advances in such essential areas as vaccine innovation, and disease treatment and prevention. The networks and centres help to propel research and development done in Canadian laboratories into best practices and policies, useful therapies and cutting-edge technologies that serve to improve the health and well-being of all Canadians.

Protecting our Environment

The need to preserve Canada's natural environment and resources through best practices and policies demands consistent collaboration among the private, public and academic sectors. A number of networks and centres continue to address Canada's environmental challenges through committed investments that aim to not only to solve the most pressing environmental issues, but also to create jobs and to open up new markets in the environmental sector.

Engaging Aboriginal Communities

NCE networks and centres actively work to include not only the participation of many Aboriginal communities across Canada in several health- and education-related projects, but also their input in forming new best practices and policies with regards to critical environmental issues and development of the Far North.

Building Canada's Strengths

Information and communications technology (ICT) is one of Canada's strongest points in research and development.

From cutting-edge collaboration in digital media to advances in medical technologies and diagnostic tools, Canada continues to build a strong international reputation pioneering at the frontlines of new technologies that improve the quality of life of Canadians.

Growing Canada's digital media sector

It's no wonder that digital media and the digital economy are priorities for the federal government and many provinces. The Canadian Digital Media Network's (CDMN) annual conference, Canada 3.0, featured more than 150 speakers and attracted more than 2,000 delegates from industry, government and academia. It was the most tweeted topic in Canada, drove media coverage across the country, and engaged the minds and hearts of a broad group of Canadians.

"The CECR [Centres of Excellence for Commercialization and Research] program has provided the ability and focus to zero in on commercialization of a broad range of stakeholders, bringing them together. We can't emphasize enough the support and focus from NCE [Networks of Centres of Excellence]. They've really helped us in working toward our mandate of making Canada a digital nation," said Steve Currie, head of marketing at CDMN and a Canada 3.0 organizer.

In 2008, Canada's Science and Technology Innovation Council (STIC) identified information communications technology, including digital media, animation and games, as one of the country's research and development strengths.

CDMN joined the CECR program in 2009 with a goal to connect digital media clusters from coast to coast. It is collaborating with a national network of regional partners: MaRS Innovation, nGen (Niagara Interactive Media Generator), ORIC (Okanagan Research and Innovation Centre), Wavefront, TRILabs and the National Research Council Canada.

Keeping “Made in Canada” technologies in Canada

MaRS Innovation (MI) is helping two University of Toronto researchers commercialize a portable device that can tell if a patient has cancer, what type it is and its severity. MI's support also means the technology can be developed in Canada.

Developed by Drs. Shana Kelley and Ted Sargent, this inexpensive microchip technology can rapidly detect a wide range of disease states at the molecular level within 30 minutes using a simple urine or blood sample, with no need for painful and more expensive biopsies.

MI is acting as the commercialization agent for the device. It has already helped Kelley and Sargent patent the technology and launch a new company called XagenIC—the first company created through MI.

MaRS Innovation has an exclusive option to all intellectual property assets from 14 universities and teaching hospitals, representing more than \$1 billion in annual R&D. It received 209 disclosures from January 1, 2009, to March 31, 2010.

MI is now working with other financial agencies to provide startup funding for XagenIC and move the technology closer to market readiness. In 2010, it helped secure an investment from the Ontario Institute for Cancer Research to test and refine the electronic chip.

“There was a lot of interest in this technology from venture capital groups and others in California and Boston, but their participation was conditional on moving the technology to their regions,” said Dr. Rafi Hofstein, President and CEO of MI.

It's a familiar story; one that has seen some of Canada's most promising research sold to companies in other countries.

“This time, we were able to break that trend based on the tools available to MaRS Innovation through the CECR program,” said Dr. Hofstein.

The device should be available to doctors within three to four years.

Big pharma taps into Canada’s small biotech expertise

It’s not everyday that you see the world’s largest pharmaceutical companies encouraging their top scientists to work as collaborators and in partnership with a small Canadian company.

Yet that’s exactly what is happening in Quebec where scientists from Merck & Co. (U.S.A.), AstraZeneca (Sweden) and Pfizer Inc. (U.S.A.) are assisting Caprion Proteomics Inc. (Montreal) to develop a diagnostic test that can better predict the onset of diabetes and monitor how patients react to different drugs.

The three pharmas are the lead industry partners in the Quebec Consortium for Drug Delivery (CQDM), a Montreal-based Business-Led Network of Centres of Excellence founded in 2008 with financial support from the federal government, two Quebec agencies and Merck, AstraZeneca and Pfizer. As members of CQDM’s board of directors and scientific committee, the companies identify promising platform technologies that can be further developed and ultimately shared between them.

They also act as mentors to smaller companies that carry out the research and provide industrial expertise, as well as access to specialized equipment, databases or clinical samples.

Caprion, for example, is receiving guidance from Dr. Sotorios Karathanasis, Vice-President, Bioscience (AstraZeneca); Dr. Ranabir SinhaRoy, Director, Diabetes and Obesity Site Lead (Merck); and Dr. Judith Treadway, Research Fellow (Pfizer).

Pfizer Canada: A committed NCE collaborator

Pfizer Canada's research development pipeline depends on collaborations with university centres of excellence. In addition to CQDM, the company is partnering with four other NCE commercialization centres.

In December 2009, Pfizer entered into a three-year, \$9-million research collaboration with the BC Cancer Agency and the Vancouver Prostate Centre, a University of British Columbia and Vancouver General Hospital Centre of Excellence, to tackle new treatment avenues for breast, ovarian and prostate cancer. This is the single-largest investment by Pfizer into British Columbia's public research sector, and it recognizes the strength and world-class cancer expertise that resides in this province. The research, which will be conducted through the Translational Research Initiative for Accelerated Discovery and Development (PC-TRIADD), will help Pfizer to more efficiently test new agents to delay the progression and improve survival in prostate cancer patients.

Pfizer is also contributing funding and expertise to the Centre for Drug Research and Development, a CECR based in Vancouver. It provided \$3 million to create the Pfizer-CDRD Innovation Fund, which is supporting six scientific opportunities with promising commercialization potential in the areas of cancer and diabetic ulcer healing.

"In these challenging economic times, the importance of enhancing Canada's scientific research community is critical, and advancing R&D is the best way to bolster our country's competitiveness," said Paul Lévesque, President, Pfizer Canada. "CDRD builds on the strength of hundreds of researchers and applies business discipline and scientific rigor to select promising technologies for development, giving Canada and British Columbia a leading edge towards a prosperous knowledge-based economy."

Pfizer is contributing a further \$1 million to the PRevention Of Organ Failure (PROOF) CECR to improve the quality of life for Canadians faced with heart, lung and kidney failure. The funding is going towards new biomarker initiatives, and eventually will expand to cover relevant projects that are led by PROOF focusing on the translation of biomarkers into clinical practice.

Pfizer is also a partner in the Centre for Probe Development and Commercialization at McMaster University.

Kitchener start-up exploits global market niche

Technology that started as a GEOIDE (GEOmatics for Informed DEcisions) research project in 2005 is now being sold globally by a Kitchener, Ontario, start-up founded by one of the network's former students. While at the University of Waterloo, Kurtis McBride began work on a technology that automates traffic cameras and web-based monitoring software, replacing the need to have people sit at the side of the road collecting data that is then analyzed manually. The system reduces the cost of collecting, analyzing and reporting accurate traffic data.

McBride later founded Miovision Technologies Inc., which manufactures the system in Kitchener. The company plans to double its staff to nearly 50 over the next two years.

Its customers, some 100 globally, include municipalities, state departments of transportation, engineering consulting firms and private data collection firms. GEOIDE, the Ontario Centres of Excellences, the Waterloo Accelerator Centre and other investors gave financial support to create the start-up company.

Training university students for real-world jobs

When Dr. Erik Hadley began thinking about career options as a graduate student, he realized quickly that his university training hadn't fully prepared him for a job in industry. He lacked two critical skill sets: industry-relevant job experience and knowledge of Vancouver's local biotech industry, where he hoped to eventually get a job.

Then he learned about the Centre for Drug Research and Development (CDRD), a CECR located at the University of British Columbia that works with the province's academic research and health institutions in drug discovery. His 21-month postdoctoral fellowship there gave him industry experience and a competitive advantage in the job market.

“One of the greatest benefits of my experience at CDRD was insight into the bigger picture regarding the significance of the research projects that I was involved in. I was challenged to think not only of how to move a project forward, but of the utility and long-term commercial viability of the products we were developing.”

“CDRD provided a great way to jumpstart my career while doing meaningful work. I gained valuable contacts in industry and developed skills that would be beneficial to a prospective employer,” said Dr. Hadley, one of 81 young professionals trained through the CECR program in 2009-10 and one of 45 trainees to participate in the CDRD training program to date.

For example, he learned how to work in large teams involving researchers from multiple disciplines, manage complex projects, move a drug candidate closer to commercialization and understand the business case behind drug development. He also met and collaborated with dozens of researchers, many of whom had worked at some point in their career for a local biotech company.

Canada’s productivity could increase by \$2,000 per person annually if it produced as many master’s and PhD level students per capita as the United States.

Source: Institute for Competitiveness & Prosperity, Report on Canada, June 2010

Dr. Hadley said that experience was key to him landing a job in April as a scientist at Vancouver biotech firm STEMCELL Technologies Inc. where he is developing new stem cell culture products.

STEMCELL Technologies has partnered with the Stem Cell Network to offer a three-day Commercialization Boot Camp—designed to give SCN trainees insight into the process of turning a research idea into a saleable product. Trainees will learn about market potential, intellectual property, licensing and return on investment, as well as gain an understanding of R&D product design and development, quality control, marketing and sales and customer support.

Creating new products and new markets for Canada's forest and manufacturing industries

Creating new products and new markets for Canada's forest and manufacturing industries is the mission of the ArboraNano Business-Led network. FPIInnovations, a co-founder of ArboraNano, teamed up with NORAM Engineering and Constructors Ltd. of Vancouver on the design and construction of a demonstration plant capable of producing one tonne per day of nanocrystalline cellulose (NCC). These natural nanocrystals can be extracted from wood fibres and used to produce components that are lighter, stronger, greener and more durable for diverse industry sectors, including aerospace, automotive, medical and building products. That demonstration plant is the first in the world, and is now under construction at Domtar's Windsor pulp and paper facility. The \$40.8-million project is a joint venture between Domtar and FPIInnovations (co-founder of ArboraNano), with Natural Resources Canada and Quebec's Natural Resources and Wildlife Ministry contributing \$10.2 million each to the venture. The facility is scheduled to produce industrial quantities of NCC in time for the final phases of product development and commercialization activities carried out by ArboraNano.

Ocean observing technology lands first international export

Early in 2010, a company in Burnaby, British Columbia, OceanWorks International Inc., delivered the core infrastructure for a Tsunami Warning and Early Response system for Cyprus. OceanWorks developed this node and junction box infrastructure for the VENUS and NEPTUNE Canada fibre optic cabled observatories in BC. These systems provide continual power and communications for science instruments in cabled observatories. That technology is now part of a system that will warn citizens of Cyprus and the neighbouring Mediterranean coast of incoming tsunami waves. It is being marketed globally to other ocean observatories, offshore petroleum production facilities and port security systems.

Ocean Networks Canada Centre for Enterprise and Engagement (ONCCEE), a CECR at the University of Victoria, is helping Canadian industry expand the market for ocean observing technologies. The OceanWorks sale is the first international export of this technology developed in partnership with the University of Victoria.

“This project exemplifies how industry interactions with the observatories can be used to provide Canadian industry with a significant advantage to develop and demonstrate advanced technologies while raising Canada’s profile in this emerging market area.” said Scott McLean, ONCCEE’s Director.

Preserving Canada’s heritage through engineering expertise

Public Works and Government Services Canada (PWGSC), the custodian of Canada’s Parliament Buildings, is getting help from the Intelligent Sensing for Innovative Structures (ISIS) Canada on ways to protect the Parliament buildings from earthquakes and environmental strains while preserving the heritage fabric of the buildings.

ISIS researchers are comparing the durability and safety of conventional masonry anchors in the heritage stones to ISIS-developed fibre reinforced polymers (FRP), a stronger-than-steel material that combines polymer resins and glass fibres.

FRP technologies have been proven to reduce maintenance and rehabilitation costs for bridges and other structures. ISIS research has been used in more than 200 structures across Canada, resulting in significant savings and safety advances for Canadians.

“Parliament Hill is a national historical site, and its buildings are considered to be world-class from an architectural and design perspective,” said Rob Wright, Director General of Major Crown projects for the Parliamentary Precinct at PWGSC. “The partnership that we have established with ISIS Canada and the research work we are doing in collaboration with several universities is critical to finding the best possible approaches for restoring the iconic buildings on Parliament Hill. This will ensure that these facilities continue to support Canada’s parliamentary democracy and that Canadians and international visitors continue to enjoy them long into the future.”

Improving the Health of Canadians

Fostering novel collaborations among Canada's leading health scientists

Fostering novel collaborations among Canada's leading health scientists brings advances in such essential areas as vaccine innovation, and disease treatment and prevention.

The networks and centres help to propel research and development done in Canadian laboratories into best practices and policies, useful therapies and cutting-edge technologies that serve to improve the health and well-being of all Canadians.

Canada accelerates development of promising vaccines

The federal government's investment in a vaccine commercialization centre in 2008 is beginning to produce results. The Pan-Provincial Vaccine Enterprise (PREVENT) has already licensed and begun testing vaccines that target a serious respiratory infection in babies (respiratory syncytial virus-RSV), Lou Gehrig's Disease (amyotrophic lateral sclerosis [ALS]) in humans and chronic wasting disease (CWD) in domesticated and wild deer and elk populations. The latter project, funded through PrioNet Canada's Bootstrap technology assessment program, is also the first time that antibodies against a prion disease like CWD have been studied for the treatment of cancer. Clinical trials are expected to begin within four to five years.

"Any time one can potentially increase the efficacy of a vaccine or broaden the potential value of a vaccine is very clearly a huge advantage," said PREVENT Co-Founder Dr. Andy Potter. He added that linking research and commercialization components between an NCE like PrioNet Canada and a CECR like PREVENT is unique in Canada and will translate into accelerated results.

Helping stroke patients get on with their lives

After emergency care ends. After treatment in hospital is over. After therapy is complete. After you are back at home. What then?

Studies show that 50 percent of people who return home after having a stroke do not have a meaningful activity to fill their day. That's why the Canadian Stroke Network funded a national project called *Getting on With the Rest of Your Life After Stroke*. It puts into practice the best recovery research and provides valuable tools to help people regain their lives.

The four-year project—the largest clinical trial into stroke recovery—is the first of its kind to develop and evaluate a model for community participation post-stroke. The ultimate goal is to develop a community-based program for people with stroke that can be delivered across the country.

For example, participants in *Getting On With the Rest of Your Life After Stroke* in Winnipeg have produced a brochure for stroke patients “with information that they wish they had known on discharge from hospital,” said Dr. Ruth Barclay-Goddard, Assistant Professor at the University of Manitoba.

Working with arthritis patients to raise awareness

The Canadian Arthritis Network (CAN) has been working closely with people with arthritis (or “consumers”) since it was founded in 1998. So when Cheryl Koehn, the founding chair of CAN's Consumer Advisory Council and founder of Arthritis Consumer Experts, requested CAN's support for a grass roots national arthritis awareness program, CAN didn't hesitate to provide expert guidance and people to help execute the campaign. The “Arthritis is Cured! (if you want it)” National Arthritis Awareness Program was designed to debunk myths and change Canadians' perceptions of the effects arthritis has on their communities and on the lives of people living with it and their families.

The Phase I launch of the program in October 2009 mobilized more than 150 volunteers—including several representatives from CAN—to carry out awareness-raising activities in Toronto, Montreal, Vancouver, Calgary, Ottawa and Halifax. CAN staff also assisted with Phase II of the program, which focused on outreach to primary care health professionals considered “influencers” in their community.

Blood test to identify organ rejection moves closer to regulatory approval

A simple blood test that eliminates the need for invasive and expensive biopsies is on track to seek regulatory approval in 2011 from Health Canada and the U.S. Food and Drug Administration. The Biomarkers in Transplantation initiative, primarily funded by the PROOF Centre of Excellence and Genome British Columbia, recently teamed with Luminex Corp. to further develop and clinically validate the biomarker tests.

The tests, which will be available in hospital laboratories, will help reduce the need for expensive, invasive and fear-evoking post-surgery biopsies.

They can also save the Canadian health care system tens of millions of dollars annually. A single biopsy costs more than \$3,000, and the average heart transplant patient recipient undergoes between 12 and 18 of these invasive procedures in the first year alone.

Preventing another Walkerton-type tragedy

Bioniche Life Sciences Inc. of Belleville, Ontario, is marketing a vaccine for cattle that significantly reduces the levels of E.coli 0157 in their manure. The product can trace its roots to an unlikely alliance that started with an early NCE, the Canadian Bacterial Diseases Network, between researchers involved in human vaccines and animal health.

“Here you had somebody in a medical school and somebody in a veterinary-related organization coming together that probably never would have spent a lot of time working together or not even know each other. Now there’s a vaccine that Bioniche is marketing to prevent another Walkerton from occurring,” says Dr. Lorne Babiuk, Vice-President, Research, at the University of Alberta.

Those early collaborations also created the relationships that eventually led to the launch of a new CECR—the Pan-Provincial Vaccine Enterprise (PREVENT)—which links vaccine centres in Saskatchewan, Nova Scotia and British Columbia. Babiuk is PREVENT’s chair.

Training Alberta teachers to save lives

The Government of Alberta is the first provincial government to test a new on line program that trains school teachers to recognize and manage anaphylaxis, a life-threatening allergic reaction that threatens 1 to 2 percent of Canadians.

The program is also designed for daycare staff and restaurant employees. Discussions are underway to implement the program with other provinces and school boards.

Developed by Dr. Anthony Levinson, assistant professor at McMaster University, with funding from NCE network AllerGEN, the tool provides information on the policy and legal issues surrounding anaphylaxis, how to identify signs and symptoms, how to respond to an anaphylactic emergency and how to reduce risk in schools.

Partnership deals accelerate trials for prostate cancer drug

Prostate cancer is a stubborn disease to treat, but there is new hope. Vancouver-based OncoGenex Pharmaceuticals Inc. has begun a Phase 3 trial under a global marketing and development deal with Israeli-based Teva Pharmaceutical Industries Ltd. to commercialize a new drug licensed from a Vancouver-based CECR, the Prostate Centre's Translational Research Initiative for Accelerated Discovery and Development (PC-TRIADD). PC-TRIADD is also providing support to the trial, which involves about 300 men and 50 cancer centres. The drug, OGX-011, targets treatment resistance in cancer patients. Royalty payments are already flowing back to the Vancouver Prostate Centre and The University of British Columbia.

PC-TRIADD has licensed eight drug products so far and spun off two companies, including OncoGenex, which was named Canadian Biotech company of the year by BIOTECanada.

“OncoGenex has been able to significantly advance its drug development platform this year and achieve key milestones which have brought major global investment back to Canada. These achievements would not have been possible without the initial discoveries made at the Vancouver Prostate Centre and the ongoing involvement of PC-TRIADD,” says Scott Cormack, President/CEO, OncoGenex.

Protecting our Environment

The need to preserve Canada's natural environment and resources through best practices and policies **demands consistent collaboration among the private, public and academic sectors**

A number of networks and centres continue to address Canada's environmental challenges through committed investments that aim not only to solve the most pressing environmental issues, but also to create jobs and to open up new markets in the environmental sector.

Alberta invests in national carbon management centre

The Alberta government will provide \$25 million to match contributions from the Canadian government and industry to support Carbon Management Canada, a new NCE of university, industry and government partners that is pursuing innovative ways to develop the technologies, people and policies to reduce carbon emissions by 40 percent of the nation's 2050 reduction targets.

"Perhaps the biggest challenge our energy sector faces is the need to manage greenhouse gas emissions while remaining competitive," said Alberta Premier Ed Stelmach. "We will overcome this challenge by continuing to invest in innovation and technology today that will inspire the solutions of tomorrow. We owe it to future generations of Albertans to further our clean energy story."

CECR provides testing facility for biofuels company

The Bioindustrial Innovation Centre (BIC), a Sarnia-based CECR launched in 2008, has its first tenant. Toronto-based Woodland Biofuels Inc. will begin using the newly renovated laboratory and demonstration plant facilities this fall to scale up and test new technology for conversion of wood to fuel-grade ethanol. Its \$10-million facility will use gasification to convert wood wastes to synthesis gas, which through a series of patented catalytic conversion and recovery steps produces full-grade ethanol. Woodland Biofuels plans to hire 30 demonstration plant employees initially and an additional 40 employees in connection with its first commercial plant. If the technology is successful, it could hire an additional 585 employees over the next five years. Funding for BIC was provided by the Centres of Excellence for Commercialization and Research (CECR) program and the Ontario government.

“Thanks to support we’ve received from the federal and Ontario governments, we can begin building a demonstration plant that we expect will confirm our ability to successfully produce ethanol from renewable waste at a commercial cost of less than \$1 per gallon. Achieving this will put Ontario and Canada in the front of the global race to find an alternative to fossil fuels, while providing significant economic and environmental benefits.”

Green additive strengthens concrete by 40 percent

Proof of principle funding from GreenCentre Canada is assisting researchers at seven Canadian universities to further develop promising green chemistry technologies into non-toxic chemical processes, green molecules, green building materials and pollutant reduction technologies, among others.

For example, this funding is helping researchers at Lakehead University move closer to commercializing a green cement additive that shows potential in significantly strengthening concrete while also reducing greenhouse gas emissions. The technology increases concrete strength by up to 40 percent while also reducing the amount of Portland cement needed to make concrete. The production of Portland cement, which involves heating calcium carbonate and clay at extremely high temperatures, is responsible for an estimated 7 percent of all greenhouse gases produced annually. Globally, approximately 1.35 billion tons of Portland cement are produced each year, releasing an equivalent amount of CO₂ into the air.

Canadian companies produce about 15 million tonnes of cement annually, worth more than \$1.7 billion. More than 4 million tonnes are exported, primarily to the U.S.

Paving the way for hybrid electric cars

Ontario researchers with the AUTO21 Network of Centres of Excellence will soon be gathering critical technical data for the new Toyota Prius Plug-in Hybrid vehicle (PHV).

Toyota recently unveiled the plug-in version of the Prius hybrid and is engaging in global trials to assess its performance in a variety of driving and climate conditions. The Ontario testing partners include AUTO21, the Province of Ontario (Ministry of Energy, Ministry of Transportation), Ontario Power Generation and the City of Toronto. Data collection will also occur in British Columbia, Manitoba and Quebec.

“We’re encouraged to be joined by partners from across stakeholder groups, and their participation will help ensure the successful introduction of plug-in vehicles to the Canadian market,” said Sandy Di Felice, Director, External Affairs, at Toyota Canada Inc. “We are pleased to have the AUTO21 Network of Centres of Excellence on board as part of the first phase of this national trial. Their expertise and feedback will play a key role as we continue to plan for the launch of plug-in vehicles.”

Regina spin-off commercializes water management technology

Five days can be too long for a municipality to find out whether contaminated wastewater is being released into a river or lake. To help speed the process, the cities of Regina and Moose Jaw worked with local engineering firm Droycon Bioconcepts Inc. to come up with a faster and more cost-effective monitoring method.

Behrooz Razban, an engineering student from the University of Regina, was recruited through the MITACS ACCELERATE internship program to test hundreds of samples from the cities’ wastewater treatment plants. The results of that testing are helping municipal operators to replace their current five-day standard test with a much shorter process. Razban is now working with a new spin-off company formed by Droycon to commercialize the technology. “The sooner students get involved in the challenges associated with the commercial development of discoveries, ideas and improvements, then the better that student becomes prepared to make useful contributions,” said Droycon President Dr. Roy Cullimore. “The benefits from this work will take the time to validate, verify and prove that this new methodology is at least 80 percent faster, 50 percent cheaper and delivers greater precision than the present tried and true methods that have been around for a century. Participation in the NCE’s MITACS ACCELERATE program added to the quest for the best.”

Engaging Aboriginal Communities

NCE networks and centres actively work to include Aboriginal communities

NCE networks and centres actively work to include not only the participation of many Aboriginal communities across Canada in several health- and education-related projects, but also their input in forming new best practices and policies with regards to critical environmental issues and development of the Far North.

Aboriginal communities take active role in arthritis research

The Canadian Arthritis Network is working directly with First Nations, Inuit and Métis communities across Canada to build research capacity and partnerships to dramatically improve the lives of adults in their communities living with arthritis. Building on the success of its National Aboriginal Arthritis Research Initiative—the first program of its kind in Canada—CAN launched a second round of competition (NAARI II) in October 2009.

The new funding will enable researchers to work with aboriginal leaders to study the progression of arthritis in this vulnerable population as well as bio-reconstructive treatments for joint injuries, models of care and health care delivery, and health promotion and awareness.

“For all Aboriginal people, health cannot be dealt with in isolation from other issues. This understanding requires a commitment to capacity building, knowledge translation and the use of ethical approaches that are consistent with Aboriginal values. The Canadian Arthritis Network’s National Aboriginal Arthritis Research Initiative is a long-term strategy for building on the mutual respect and trust between the researchers and Aboriginal communities across Canada and gives hope to all Aboriginal people living with arthritis in Canada.”

Reducing violence through understanding and outreach

In 2009, the RCMP began using a new toolkit titled *Engaging and Empowering Aboriginal Youth* to improve relationships with Aboriginal youth and address violence prevention.

The 126-page resource, developed by PREVNet researcher Claire Crooks (University of Western Ontario), and PREVNet partners, the RCMP and the Canadian Red Cross, is the most extensive of its kind in Canada. Its guiding principles include understanding and integrating cultural identity, increasing youth engagement, fostering youth empowerment and developing and maintaining effective partnerships.

PREVNet researchers also worked with the Network's Aboriginal Working Group and the Red Cross to evaluate Walking the Prevention Circle—a violence prevention program designed to support Aboriginal communities in promoting healthy relationships and healthy development for their children and youth.

Helping Aboriginal women avert diabetes

Canadian Obesity Network researcher, Dr. Michelle Mottola (centre) at the University of Western Ontario is helping to promote the importance of a healthy lifestyle during pregnancy to prevent gestational diabetes among Aboriginal women.

She has partnered with the Southern Ontario Aboriginal Diabetes Initiative, which has developed the Ribbon of Life program to support diabetes awareness, as well as the Oneida Health Centre and the Aboriginal Brotherhood. In the summer of 2009, she took the Ribbon of Life program to local communities with the help of Western students Erin Kelly of Walpole Island First Nation, and Lindsay Doxtator of Oneida Nation of the Thames.

Empowering communities to provide safe drinking water

The Canadian Water Network is a founding partner in RES'EAU WaterNET, a national network funded by NSERC and hosted at the University of British Columbia (UBC). Launched in 2009, the new network is developing affordable solutions for delivering safe drinking water to the estimated six million Canadians living in small, rural and First Nations communities. Nearly 2,000 municipalities and thousands of private connections in Canada get their drinking water from a small water system. RES'EAU's grassroots approach to research is designed to provide technology solutions scaled to small and rural community needs. Just as importantly, it also ensures that decision makers in these communities can adopt any new approaches to water treatment.

High school students introduced to food science...

First Nations, Métis and Inuit (FNMI) teenagers had an opportunity during their 2010 spring break to work alongside some of Canada's top scientists to conduct experiments in leading-edge food and nutrition research. The "Verna J. Kirkness Food Researcher for a Week" program—developed and organized by the Advanced Foods and Materials Network (AFMNet)—provided 10 FNMI students from across the country with an all-expenses-paid trip to spend one week in a university lab, where they gain hands-on experience in food science research. Selected through a national competition, the students from Nunavut, Saskatchewan, Manitoba and Ontario were placed at the University of Toronto, the University of Guelph or The University of British Columbia. The program's 2009 inaugural year provided a similar experience for 12 FNMI students.

"Education is the key to the future of our young Aboriginal people," said Dr. Kirkness, a member of the Order of Canada and a lifelong advocate of Aboriginal education. "An opportunity to be a food researcher for a week is an exciting and meaningful connection to the broad world of science. As the program continues, it will motivate our youth to consider science as an inspiring field of study."

Arctic science

ArcticNet's Schools on Board program introduces high school students and teachers to the wonders of Arctic science and inspires students to consider careers in science, research and the environment.

Changing the dynamics in forest management

One of the major achievements of the research done by the Sustainable Forest Management (SFM) Network is the recognition of the role Aboriginal people can play in the development of forest management policy. The SFM Network represents one of the few forums to bring Aboriginal and non-Aboriginal researchers, forest resource managers and policy makers around one table to promote dialogue and the development of a common understanding in a non-confrontational environment.

In Northern Alberta, for example, SFM Network researchers worked with the Little Red River Cree Nation over several years to understand their views on forest management and forest processes. A forest company working in the area has since incorporated that knowledge into its forest management plan.

The SFM Network's Sustainable Aboriginal Communities (SAC) Research Area has supported more than 60 projects since 2001, including the accommodation of Aboriginal and treaty rights; the integration of Aboriginal values, knowledge, and management systems; and the engagement of Aboriginal peoples in forest management and the economic development of forest resources.

"It significantly changed how the company manages the forest," said SFM Network Scientific Director Dr. Jim Fyles. "Had the SFM Network not laid the groundwork for this, it would have been much less likely for these kinds of changes to occur."