

2014-2015
Annual REPORT

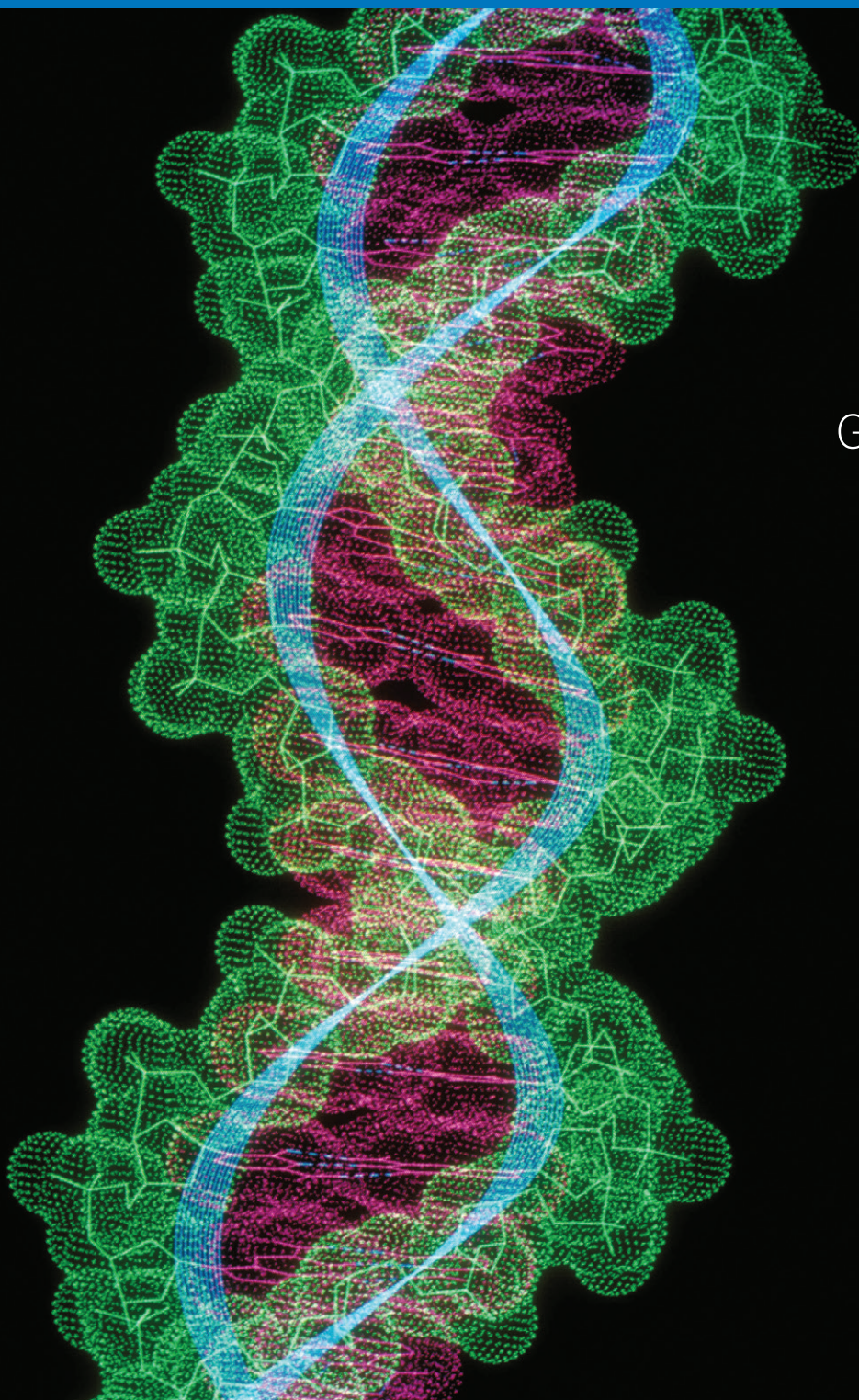
GLOBAL CHALLENGES + GENOMIC SOLUTIONS

**Research to
OUTCOMES**

Genomics Discovery,
Technology
and Innovation



GenomeCanada





GenomeCanada

who we are

Genome Canada is a not-for-profit organization that acts as a catalyst for developing and applying genomics and genomic-based technologies to create economic and social benefits for Canadians. Genome Canada connects ideas and people across public and private sectors to find new uses for genomics, invests in large-scale science and technology to fuel innovation, and translates discoveries into applications and solutions across key sectors of national importance, including health, agriculture, forestry, fisheries and aquaculture, energy, mining, and the environment.

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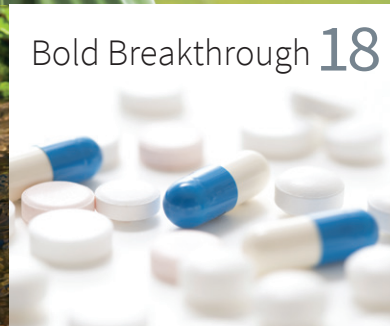
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TABLE OF CONTENTS



The Year
in Review **20**



- 4** Message from the Chair
- 6** Message from the President and CEO
- 8** Impact Stories
- 20** Highlights 2014-2015
- 27** Pursuing Our Objectives
- 39** Active Projects Funded
- 45** Genome Centre Support
- 46** Notes on Governance

- 47** Board and Management
- 51** Statement of Remuneration
- 52** Management Discussion
- 54** Financial Highlights 2014-2015
- 57** Financial Outlook 2015-2016
- 58** Auditor's Report
- 70** Acknowledgement

SCIENCE, TECHNOLOGY AND INNOVATION are the bedrock of Canada's vibrant communities and economic prosperity. Genomics — which advances our understanding of how DNA works in all living things — is one of Canada's most valuable assets and can help create social and economic benefits for all Canadians.

Now in its 15th year, Genome Canada is witnessing return on sustained federal investment in genomics. Canadian scientists played a prominent role in recent international breakthroughs such as sequencing the Atlantic salmon and wheat genomes — research that our fisheries, aquaculture and agri-food industries will capitalize on. Canadian researchers have made significant advances in cancer, autism and rare diseases, directly touching the lives of families affected by these conditions.

Genome Canada is catalyzing our nation's genomics enterprise by building strategic partnerships and making the necessary investments in people, technology and programs that fuel the research pipeline from discovery to real-world applications.

The organization is perfectly positioned to fulfill the Government of Canada's new Science, Technology and Innovation strategy. It is helping to "seize Canada's moment" by growing talent in genomics, maintaining our knowledge leadership in the field, and encouraging business innovation, as we have seen happen most recently through the Genomic Applications Partnership Program. This program is proving attractive to industry partners and others.

I was particularly pleased to see the federal strategy expand its priority research areas to include agriculture. This is a sector where genomics excels. From breeding better livestock to enhancing crop yields and protecting consumers from food-borne illness caused by *E.coli* and *Listeria*, genomic solutions play a key role. This is why in 2014 Genome Canada launched a program called *Genomics and Feeding the Future*, which will fund multiple large-scale applied research projects that build on the great body of knowledge our research community has already generated in this sector.

I am so proud that thanks to sustained federal investment, Canada remains at the forefront of this cutting-edge field. By investing in genomics we are investing in our future. I am excited about all the amazing breakthroughs to come.

As always, my appreciation goes out to my fellow Genome Canada Board members, Genome Canada's incredibly dedicated staff, our brilliant research community, and our many partners who recognize the true power and promise of genomics.



Lorne Hepworth,
Chair, Board of Directors
Genome Canada




Investing in Genomics is Investing in Our Future



‘I was particularly pleased to see the new federal Science, Technology and Innovation strategy expand its priority research areas to include agriculture. This is a sector where genomics excels.’

JEAN-MARC CARISSE

A Maturing Science, a Powerful Technology

A middle-aged man with a receding hairline and a light beard, wearing a dark pinstriped suit, white shirt, and patterned tie, is smiling. He is standing in front of a large window. The window reflects the interior of a building with a grid pattern. Outside the window, a cityscape is visible under a clear blue sky, including a bridge and buildings with green roofs.

‘Many Canadian businesses are recognizing that genomics can provide them with a competitive edge globally.’



THE 2014-15 FISCAL YEAR was an incredibly productive one for Genome Canada. A dozen new partnerships are up and running between academics and genomic “users” with support from our Genomic Applications Partnership Program (GAPP). These projects bring genomic solutions to challenges in areas as diverse as forestry, aquaculture, mental health, greenhouse vegetables, animal feed and cheese-making.

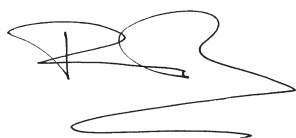
These projects also signal how genomics is maturing as a science. A decade ago, Canada was in full capacity-building mode with respect to genomics. We were establishing the talent and technology infrastructure needed as a foundation. Today, we see public and private sector organizations looking to genomics as a means to address some of their most pressing challenges. Many Canadian businesses are recognizing that genomics can provide them with a competitive edge globally.

A case in point is the story of Xagenic, a Toronto-based start-up slated to become the first company in the world to provide advanced molecular diagnostics at the point of care. The technology that has become the backbone of the company has its origins in a 2007 Genome Canada investment in new technology development. Xagenic is now part of a GAPP project aimed at producing new diagnostic tests and devices that will allow the company to grow further and realize new revenue streams as it deploys its first products across North America.

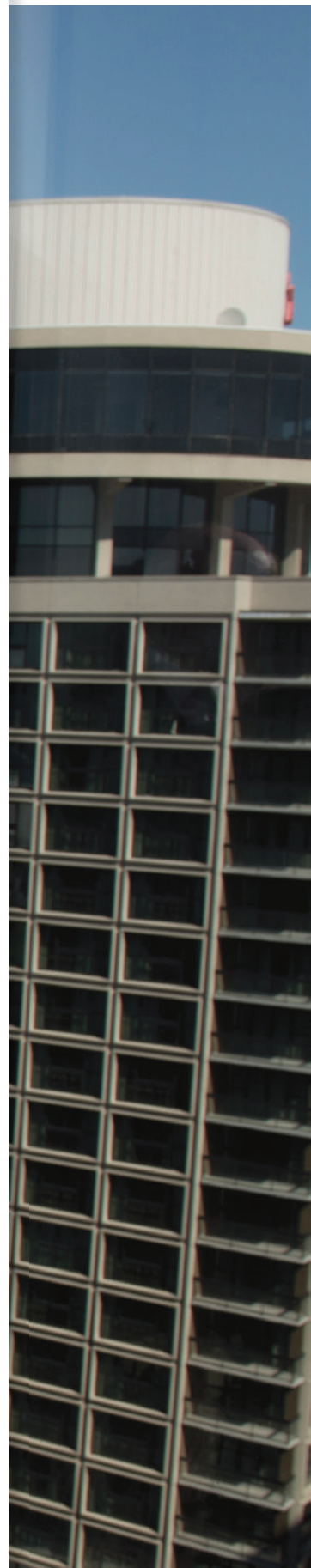
To keep Canada at the leading edge of this rapidly-evolving field, Genome Canada launched the Genomics Innovation Network comprising 10 “Nodes” across Canada — each a centre of excellence for technologies used in genomics and related areas of research. Working collaboratively, the Nodes are advancing genomics-based innovations and at the same time addressing challenges related to the storage and analysis of “big data” so that genomics research can achieve its full potential in terms of benefits for the economy and our society at large.

Meanwhile, we continue to fuel the pipeline of discovery by supporting large-scale science. We launched *Genomics and Feeding the Future* to drive research in a critical trio of sectors: agriculture, fisheries and aquaculture. Our next large-scale applied research project competition will focus on delivering genomic solutions to challenges pertaining to Canada’s natural resources and the environment.

I wish to thank the Government of Canada for continuing to invest in genomics, recognizing its power and promise to bring social and economic benefits to Canadians. I also wish to thank our Board, staff, the six regional Genome Centres, our research community and the multiple partners who are all committed to the vision we share.



Pierre Meulien, Ph.D.
President and Chief Executive Officer
Genome Canada





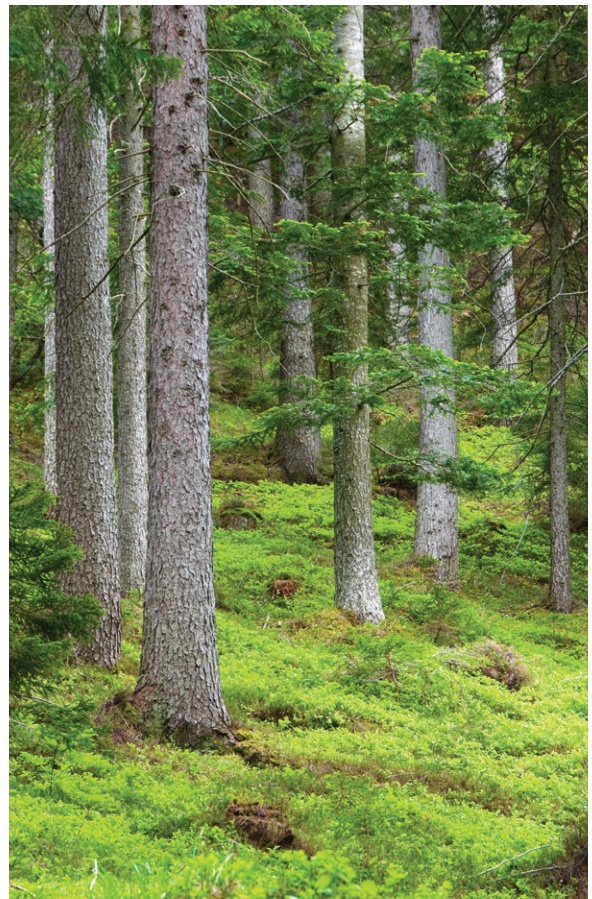
pest defence

New genomic detection tools will safeguard Canadian forests and farms from destructive pests and pathogens

UNIVERSITY OF BRITISH COLUMBIA forestry professor Dr. Richard Hamelin and his partners at the Canadian Food Inspection Agency have a “most unwanted list” — 50 invasive pests and pathogens that could cause an ecological and financial disaster if they infest the country’s forests and farms.

Alien species are responsible for annual losses of about \$2 billion in Canada’s forestry and agriculture industries, but it can take days or weeks to identify problematic invaders at ports of entry. Species without morphological features, such as microscopic fungi, have to be cultured in a Petri plate to determine if they are a threat. Some only become virulent when they are inside a host.

Predictive new biosurveillance tools allow laboratory technicians to rapidly and accurately ascertain



whether a pathogen will cause harm by amplifying and analyzing the DNA from a single cell, a development that will help keep Canada's forests and farms healthy and productive in an era of climate change and increasing international trade.

"The key to any intervention is early action," says Dr. Hamelin, who parlayed earlier Genome Canada-funded research exploring DNA-based diagnostic tests and forest pathogen sequencing into a three-year GAPP (Genomic Applications Partnership Program) project that is transferring this technology from the lab to the real world. "Once the genie is out of the bottle, it's very hard to contain it."



“It's so rewarding when your research becomes a tool in somebody else's hands.”

— Dr. Richard Hamelin, forestry researcher

The Asian gypsy moth (AGM) and a plant pathogen called *Phytophthora ramorum* are the targets of Dr. Hamelin's GAPP project. The CFIA, a co-developer of the technology, will use lab-validated tests to intercept these destructive bugs.

"The AGM is not present in North America but keeps knocking at the door," says Hamelin. "Our response has to be vigilant and national, because an invasive species can affect landscapes across the country."

"The collaboration between partners has been phenomenal," says Cameron Duff, the CFIA's Executive Director of Plant Health Science. "This is absolutely essential, not only from a technological and intellectual perspective, but also because it is helping us develop an integrated network that is working to protect our forest resource base."

"The application of this technology will help us contend with significant risks and inform sound science-based decisions," he adds. "It's a game-changer. This project and platform are a foundation that can be expanded in the future."



Protecting Canada's Forests against Invasive Alien Species by Next Generation Biosurveillance, a \$2.34-million GAPP project supported by Genome Canada, Génome Québec and Genome BC, brings together academic researchers and government user partners from across the country and demonstrates the value of multi-regional collaboration when contending with pan-Canadian challenges. The translational research project has its foundations in a Genome Canada-funded 2010 Large-Scale Applied Research Project in forestry, led by Dr. Hamelin. Adopting DNA detection tools is expected to save Canada's forestry and agriculture sectors an estimated \$374 to \$625 million over three to five years.



cracking wheat


Canadian researchers are part of an international team uncovering the secrets of the wheat genome to better meet growing global food demand

WHEAT FIELDS are as quintessentially Canadian as the snow-capped Rockies and the shoals of Peggy's Cove. To farmers, that same wheat represents a \$4 billion annual industry. To genomics researchers, it's a field of exploration they are just beginning to map.

Canadian scientists are part of an international team that in July 2014 published the first chromosome-based draft sequence of the wheat genome, a breakthrough that offers wheat breeders powerful new knowledge for their quest to meet the demands of world population growth and climate change, including a projected 70 per cent increase in global food demand by 2050.

"The release of the draft wheat genome sequence will accelerate gene discovery in wheat, and pave the way for the development of tools to improve the breeding of complex traits such as yield, insect and disease resistance, and end-use quality," said Dr. Curtis Pozniak, a University





of Saskatchewan professor and co-leader of the Canadian Triticum Advancement Through Genomics (CTAG) project, a multi-year, multi-million dollar project, supported by Genome Canada, Genome Prairie and others, focused on the sequencing of the wheat genome.

Dr. Pozniak and his team are part of the International Wheat Genome Sequencing Consortium (IWGSC), which is in the process of sequencing each of the 21 chromosomes of bread wheat. Involving more than 1,000 researchers worldwide, IWGSC's goal is to complete a "reference sequence" or completely mapped wheat genome, which is five times larger than the human genome. Seventy-five thousand genes have already been mapped.

At the same time, the University of Saskatchewan's Crop Development Centre is leading a national multidisciplinary team in using the latest in DNA sequencing technology to develop genomic tools for marker-assisted breeding.

This identifies genetic variation between members of the same species. Wheat breeders can use "marker assisted selection" to help select plants for characteristics including cold and drought tolerance, gluten strength, pre-harvest sprouting and resistance to wheat rust, fusarium head blight and insects.

Over the past three years, the researchers have sequenced important regions of the genomes of more than 100 wheat cultivars, and identified well over 100,000 genetic markers.

“Canada has a world reputation for the highest-quality wheat. This research will improve the efficiency of plant breeding and ensure our producers remain competitive.”

— Dr. Curtis Pozniak, biologist

The three-year, \$8.5-million Canadian Triticum Advancement Through Genomics (CTAG) project, led by wheat breeders Dr. Curtis Pozniak and Dr. Pierre Hucl of the University of Saskatchewan, was funded through Genome Canada's 2010 Large-Scale Applied Research Project Competition. Funding partners were Genome Prairie, the Saskatchewan Ministry of Agriculture, the Alberta Crop Industry Development Fund, the Western Grains Research Foundation, Alberta Innovates, and Viterra.



safer meat

A simple, quick and economical genomic test can help stop the spread of *Escherichia coli* and other dangerous contaminants

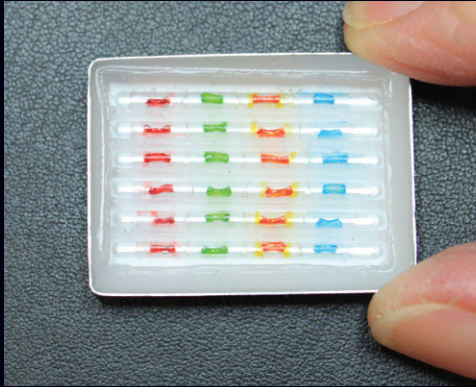
IN THE PAST FEW YEARS, the largest beef recall in Canadian history and a deadly listeriosis outbreak have revealed how challenging it can be to protect people from tainted meat. But an automated genomic test developed by a team of University of Alberta researchers has the potential to transform the way food producers detect *E. coli* and other bacteria, and to ensure that meat is safe to eat before it leaves the packing plant.

“Inspections only really find out whether companies are following food safety regulations,” says experimental oncologist Dr. Linda Pilarski, who is leading this project with microbiologist Dr. Lynn McMullen. “You need good technology to know if there are pathogens present.”

The platform created by the U of A colleagues is essentially a “molecular copying machine,”

says Dr. Pilarski. A technologist who does not need special training can place bacteria from a meat sample in a cassette the size of a postage stamp, put the cassette inside a shoebox-sized device and press a button. Less than eight hours later — compared to the current one or two days — they will know whether disease-causing *E. coli* bacteria are present. And it will cost under 50 cents per sample for a comprehensive array of tests.

The third member of the U of A team is Dr. Patrick Pilarski, a biomedical device specialist who led development of the system’s software interface. “What allows this test to be so widely deployable and so simple,” he says, “is that the system involves automated analysis of detailed test data. It boils everything down to a ‘yes’ or ‘no’ decision for the user, even though there is a lot happening under the hood.”



The Rapid Sampling and Detection of STEC (Shiga toxin-producing *Escherichia coli*) in Meat project exemplifies both an interdisciplinary collaboration between researchers from diverse fields, and an effective cross-section of funding partners. In addition to Genome Canada and Genome Alberta, the \$726,000 project was also supported by the Alberta Livestock and Meat Agency, Alberta Innovates Bio Solutions, Génome Québec, and two Ontario government departments: the Ministry of Agriculture and Food and the Ministry of Rural Affairs.



“With this test, we will be sure that meat is safe before it goes out on the truck.”

— Dr. Linda Pilarski, experimental oncologist



This diagnostic will help food producers maintain quality control in a cost-effective way. “The industry keeps telling us they want an answer within one work shift,” says Dr. McMullen. “Any time a company holds onto product and waits for results, it costs money. This gives producers a really quick, low-cost and accurate way to determine if food products are ready for shipping.”

While *E. coli* is the focus for now, the platform will be adapted to detect pathogens such as *Salmonella*, *Listeria* and *Campylobacter*, and it could even be used to safeguard water quality in developing countries. “This technology is extremely flexible and can be adapted for any situation that involves a molecular test,” says Dr. Linda Pilarski, whose initial research explored applications to test for certain types of cancer and sexually transmitted infections. “This technology is very powerful, and it’s ready for commercialization.”

reducing risk

New non-invasive prenatal testing methods appear to be safer, but there are complex questions to address



EVERY YEAR, APPROXIMATELY 10,000 women in Canada have an amniocentesis — a prenatal procedure in which a sample of amniotic fluid is drawn by needle and tested for chromosomal abnormalities such as Down syndrome. This type of screening carries a risk. Up to 70 pregnancies are lost each year from the complications that may occur.

Advances in genomics have led to the development of non-invasive prenatal testing (NIPT) that can screen for Down syndrome and two other genetic diseases by analyzing fragments of fetal DNA found in maternal blood. “It would be nice for women to have the safest test possible, with the highest performance and lowest risk to pregnancies,” says Dr. Sylvie Langlois, a University of British Columbia medical geneticist and co-leader of the PEGASUS (Personalized Genomics for Prenatal Aneuploidy Screening Using Maternal Blood) project. “That’s what NIPT has the potential to do.”

In addition to comparing the accuracy and cost-effectiveness of two different methods of DNA analysis, PEGASUS is also exploring the ethical, legal and social questions that surround this research, and the



implementation issues that health-care practitioners could face. It is important to provide doctors, patients and policymakers with the information they need to discuss the pros and cons of NIPT, according to project leader Dr. François Rousseau, a medical biochemist at Université Laval. Currently, NIPT is only publicly funded in certain circumstances.

“We need to be sure that our research is giving the people who are picking up the ball downstream the high-quality evidence and tools they need,” says Dr. Rousseau, explaining how an emphasis on GE³LS (Genomics and its Ethical, Environmental, Economic, Legal and Social Aspects) was woven into PEGASUS from the start.



The ethical considerations around NIPT include a concern that women may feel pressure to test, and the prospect of families facing an avalanche of complex genetic data if the range of information that can be detected expands to include predisposition to other conditions, says PEGASUS researcher Dr. Vardit Ravitsky, a professor in the Université de Montréal’s Department of Social and Preventive Medicine.

Yet NIPT could “revolutionize prenatal care,” adds Dr. Ravitsky. If women are able to test in the first trimester, they will have more time to make an informed, early choice about the outcome of their pregnancy or to prepare for the birth of a child with special needs.

PEGASUS is a \$10.5-million Large-Scale Applied Research project funded by Genome Canada, in partnership with Génome Québec, Genome BC and the Canadian Institutes of Health Research. It is one of 17 ongoing Genomics and Personalized Health projects that have the potential to transform the way health care is delivered in Canada, including improvements in clinical practice, better treatment and outcomes for patients, and a more efficient, cost-effective, health-care system.



“As a test that can be performed early in the pregnancy and without any risk to the fetus, NIPT is revolutionizing prenatal care.”

— Dr. Vardit Ravitsky, PEGASUS researcher



sorting salmon

Genomic tools will identify Atlantic salmon with the best natural variation

SALMON FARMING has come a long way since 1985, when Gifford Cooke and his sons Glenn and Michael of Blacks Harbour, New Brunswick, established their first marine site on the Bay of Fundy with 5,000 Atlantic salmon smolts.

Today, Cooke Aquaculture is North America's largest independent salmon farming company. Its operations in four provinces and the state of Maine process and sell more than 72.5 million kilograms of Atlantic salmon a year. And recent advances in genomics research seem likely to transform it into a major competitor in the global market.

Scientists have now mapped the genome of the Atlantic salmon, allowing the aquaculture industry to use genetic markers to determine which offspring have inherited the best traits for fish farming. These include resistance to diseases



and parasites such as sea lice, improved growth rate, rapid adaptation to seawater, and delayed sexual maturity.

In the past, conventional selective breeding took four years. In a cycle mimicking nature, in the fall of each year, eggs are fertilized, incubated, and hatched in temperature-controlled freshwater tanks. They are reared here from alevins to fingerlings to smolts over 12 to 18 months. At that point, siblings of the best broodstock are transferred to ocean farms for up to 23 months. When they reach 4.5 to 5.5 kilograms, they are harvested and evaluated.

Using genomic selection, Cooke Aquaculture can cost-effectively screen Atlantic salmon for desirable traits when they are just fingerlings. Families exhibiting poor trait characteristics will be eliminated early from the breeding program. This shortens the evaluation process from up to four years to just 12 to 18 months.

“We are intentionally screening for the best natural traits, and speeding up the process,” says Dr. Keng Pee Ang, Cooke’s vice-president of research. In the short term, he says, using genomic tools to improve the selection process will increase sales by \$18 million a year, and add 40 processing jobs.



In October 2014, the Hon. Ed Holder, federal Minister of State for Science and Technology, announced \$1.3 million in Genome Canada funding for the three-year, \$3.8-million “Salmon and Chips” project – one of 12 new projects announced as part of Rounds 1 and 2 of the Genomic Applications Partnership Program, which connects academics with entrepreneurs. Cooke Aquaculture teamed up with University of Guelph geneticist Dr. Elizabeth Boulding for this project, which will develop genomic tools to maximize the genetic improvement of farmed Atlantic salmon on the East Coast.

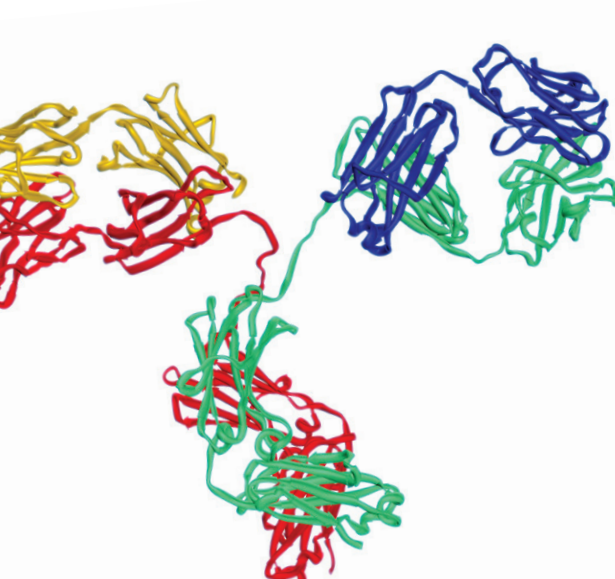
“We want to improve our broodstock program, using genomic tools, in order to compete globally.”

— Dr. Keng Pee Ang, Cooke Aquaculture



bold breakthrough

Basic science and an ambitious plan could lead to innovative new drugs and help boost an entire industry



MOST MEDICAL ADVANCES are rooted in decades of research or serendipitous discovery. But a Canadian biotech spin-off is rapidly developing a promising therapy thanks to fundamental creative thinking coupled with a specific goal.

“We are, so far, the only group in the world that has been able to pull this off,” says Dr. Sachdev Sidhu, a biochemist at the University of Toronto’s Donnelly Centre for Cellular and Biomolecular Research who fused his functional genomics expertise with the work of cancer biologists and protein scientists to spark the launch of Northern Biologics. The company is moving toward clinical tests of antibodies that could transform the way certain forms of cancer and fibrosis are treated.

“We wanted to do more than generate data,” says Dr. Sidhu, whose research was supported by Genome Canada. “We’re not trying to explain molecules to people we know. We wanted to collaborate with people in other fields and develop drugs.”

By leaping over the barriers between disciplines, Dr. Sidhu and his colleagues were able to develop a “war chest” of dozens of complex molecules (or antibodies) that can be used, for example, to subvert the pathways of rogue cells. These therapies could be on the market within a decade of their discovery, twice as fast as the typical timeline.

San Francisco venture capital firm Versant Ventures recognized the value of this research and invested \$10 million in Northern Biologics, which has secured several million for

dollars for R&D and expects to have a staff of 20 by the end of 2015. Not only does this offer new hope for cancer and fibrosis patients, it also could help invigorate Canada's biotech sector.

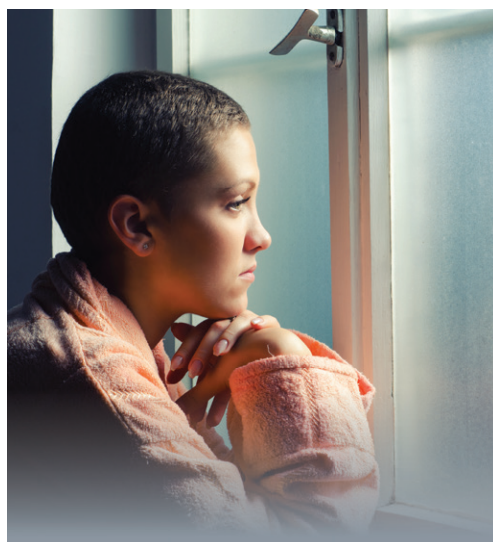
"Academia is where the really fundamental, exciting and game-changing innovation is happening," says biophysicist Dr. Stefan Larson, the CEO of Northern Biologics. "In Canada, this community is vastly underserved by early-stage capital. We have an opportunity to take these innovations and spin them out into new companies and commercial products."

What's more, connections between researchers and industry form a "virtuous circle," says Dr. Sidhu, who is on the company's scientific advisory board and serves as director of Toronto's fledgling Centre for Commercialization of Antibodies and Biologics. "This will give scientists experiences that will help us become better business people."



“We consider Northern Biologics to be a field goal. There are points on the board. The touchdown — a fully-funded, large, independent company in Canada — is what we want to do next.”

— Dr. Sachdev Sidhu, biochemist



The \$9.9-million Synthetic Antibody Program: Commercial Reagents and Novel Therapy project, led by Dr. Sachdev Sidhu and University of Toronto molecular biologist Dr. Charles Boone, was supported by Genome Canada and the Ontario Genomics Institute and completed in 2014. By developing antibodies targeted at proteins that have been associated with cancer, scientists hope to have a major impact on basic research in cancer biology, expand the options for cancer therapy and yield numerous commercial opportunities.

THE YEAR IN REVIEW

April 30, 2014

\$7.3 million is announced for Dr. Lincoln Stein and his team at the Ontario Institute for Cancer Research to develop new software tools that can effectively analyze vast amounts of genetic data to help find cures for cancer. Genome Canada is a key partner in the unprecedented collaboration.

May 25, 2014



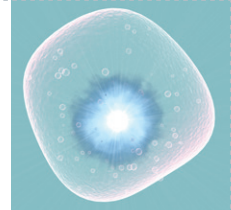
Dr. Stephen Scherer and his research team at SickKids publish a study that effectively unravels the autism code. They have found a “genetic formula” that will enable clinicians to identify genetic mutations that have the highest and lowest likelihood of causing Autism Spectrum Disorder.



Dr. Stephen Scherer, head of Applied Genomics at Toronto's Hospital for Sick Children and project leader for one of Genome Canada's Genomics and Personalized Health projects.

June 5, 2014

Outcomes of the pan-Canadian Finding of Rare Disease Genes



research project are published. The research team almost tripled its goal, solving 146 rare disorders, including identification of 67 novel genes that had never before been associated with a rare disease. The project has made Canada an international leader in rare disease research.

June 10, 2014

An international collaboration, involving researchers from Canada, Chile and Norway announces the completion of a fully mapped and openly accessible Atlantic salmon genome. This reference genome will provide crucial information to fish managers, allowing them to improve the productivity and sustainability of aquaculture operations, and will address challenges around conservation of wild stocks, preservation of at-risk fish populations and environmental sustainability.



highlights 2014-2015

ROBERT TETERUCK, THE HOSPITAL FOR SICK CHILDREN

June 16, 2014



Genomics and Feeding the Future is launched by Genome Canada, in partnership with the Western Grains Research Foundation. Under the banner of this 2014 Large-Scale Applied Research Project Competition, \$90 million will be invested over four years in projects that will contribute solutions to help feed the world's growing population.

July 21, 2014

More than a dozen Genome Canada-funded researchers list among the world's most influential scientific minds of 2014, according to a Thomson Reuters ranking based on the number of times academic papers are cited by the author's peers.

October 14, 2014

An inaugural "Call for Ideas" is launched by Stand Up to Cancer Canada, with funds of up to \$22.6 million for two "Dream Teams" to accelerate the pace of groundbreaking cancer research and bring new treatments from the laboratory to patients faster. As partners in the initiative, Genome Canada and the Canadian Institutes of Health Research, through the Cancer Stem Cell Consortium, will support one of the Dream Teams, focused on the role of cancer stem cells in resistance and treatment failure.



October 15, 2014



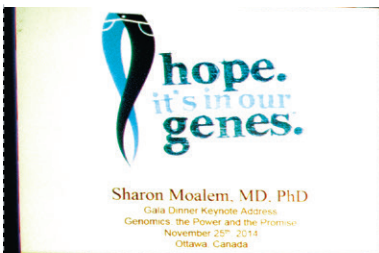
Canada's Minister of State for Science and Technology, the Hon. Ed Holder, announces \$56 million in funding to help a cross-section of industries use genomics to address business challenges.

Federal Minister of State for Science and Technology, the Hon. Ed Holder, announces the first 12 projects selected for funding under Genome Canada's Genomic Application Partnership Program. Representing a total investment of \$56 million (\$15 million of federal funding through Genome Canada and the balance from partners), the projects involve a diverse array of industries – aquaculture, cheese-making, horticulture, animal feed, crops, forestry and healthcare – that are looking to genomics to help address business challenges.

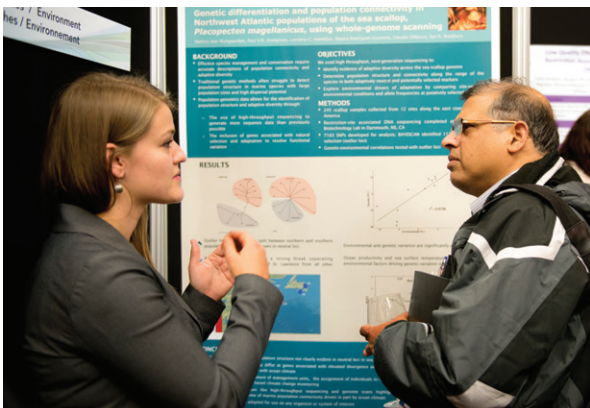
November 24-26, 2014


Genomics: the Power & the Promise

Genome Canada and the Gairdner Foundation host their signature event “Genomics: The Power and The Promise 2014,” this year exploring the theme *Genomics and the Environment*. The highly popular three-day conference gathered world-renowned experts and visionaries from across North America to share insights on the cutting-edge use of genomics in fields as diverse as personalized medicine, environmental impacts on health, adaptation to climate change in forestry and crop production, biodiversity science, and sustainable approaches to mining and energy production.



highlights 2014-2015




Sharon Mosalem, MD, PhD
Assistant Professor of Pediatrics
University of Michigan
Ann Arbor, Michigan

JEAN-MARC CARISSE

December 10, 2014

Toronto-based Northern Biologics is launched with a \$10 million investment from Versant Ventures, a U.S. venture capital firm. The biotech start-up, which aims to develop antibody-based drugs to treat cancer and fibrosis, sprung from breakthroughs by Genome Canada-funded University of Toronto researcher Dr. Sachdev Sidhu. (See feature story page 18.)



Dr. Sachdev Sidhu

February 12, 2015

Victoria, B.C.-based MRM Proteomics (MRMP), which provides advanced proteomics kits and services to the pharmaceutical, biotechnology and diagnostics industries and was spun-out of the Genome Canada-funded University of Victoria-Genome BC Proteomics Centre, signs an exclusive worldwide commercial supply agreement with Boston-based Cambridge Isotope Laboratories. The deal will make a specialized kit used for quantitative proteomics developed by MRMP accessible to researchers worldwide.

December 18, 2014

A new funding opportunity, Technology Development Funds for Nodes of the Genomics Innovation Network (GIN), is launched. It aims to support GIN Nodes in the development of new and improved technologies to ensure that the Nodes remain at the forefront in providing leading-edge genomic technologies to the research community.

January 12, 2015

A new funding opportunity is launched by Genome Canada in partnership with the Canadian Institutes of Health Research to create a national consortium that will advance the field of epigenetics, which explores how environmental factors can impact human health at the genomic level, and use the research to improve human health outcomes.

January 14, 2015

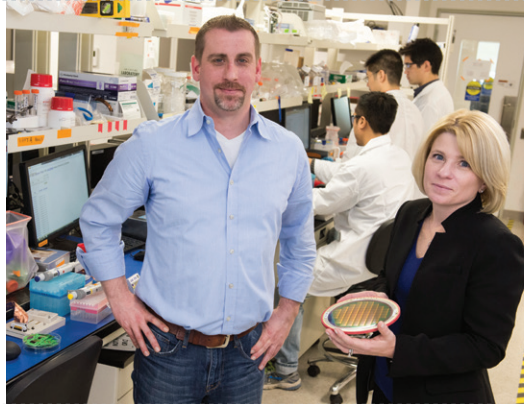


Genome Canada and partners announce funding for three new research projects to apply genomic technology to deal with the outbreak of Porcine Epidemic Diarrhea virus, a disease that kills young piglets at an astonishing rate and poses a serious challenge to North America's pork industry.



February 23, 2015

Xagenic, a Toronto-based start-up that has developed an easy-to-use, lab-free molecular diagnostic platform that delivers results in 20 minutes, is honoured as the 2015 Life Science Company of the Year by Life Sciences Ontario. The company, which is currently a partner on a GAPP project, says a 2007 Genome Canada investment helped it develop the technology, which became the backbone of its business.



Graham Jack of Xagenic Canada Inc. is partnering with University of Toronto's Shana Kelley to develop fast and accurate point-of-care testing geared at improving the clinical management of infectious disease.

March 31, 2015

Genome Canada unveils Canada's new Genomics Innovation Network (GIN) – 10 Nodes providing researchers across Canada and internationally with access to leading-edge technologies required for research in genomics, metabolomics, proteomics and related areas, and with expertise to provide advice on appropriate technologies, study design, data analysis and bioinformatics. As a Network, the Nodes collaborate and harness their collective power for the advancement of genomics research.



Canada's Genomics Innovation Network

- 1 The Proteomics Centre
- 2 Sequencing Platform at the BC Cancer Agency Genome Sciences Centre
- 3 The Metabolomics Innovation Centre
- 4 The Centre for Applied Genomics
- 5 Toronto Centre for Phenogenomics
- 6 Network Biology Collaborative Centre
- 7 Canadian Data Integration Centre
- 8 McGill University and G enome Qu ebec Innovation Centre
- 9 Centre for Advanced Proteomics Analyses
- 10 Canadian Centre for Computational Genomics



PURSuing OUR OBJECTIVES



As part of our Strategic Plan 2012-2017, Genome Canada strives to:

- **Connect** ideas and people across sectors to find new uses and applications for genomics;
- **Invest** in large-scale science and technology to fuel innovation; and,
- **Translate** discoveries into applications to maximize impact across all sectors.

We do this with a vision to harness the transformative power of genomics to deliver benefits to Canadians.

Genome Canada made considerable progress in meeting its goals and objectives under these three key mission areas during the fiscal year.

1. **CONNECT** ideas and people across sectors to find new uses and applications for genomics

- Genome Canada has aggressively pursued partnerships with other organizations on initiatives where our innovation goals are aligned. As a result, our co-funding ratios have been steadily increasing, a strong indication that stakeholders from multiple sectors recognize the transformative power of genomics and are keen to co-invest. In March 2015, Genome Canada's cumulative investments for all programs since our inception involved a co-funding ratio of approximately 1:1. Overall, programs launched since 2012 have seen a co-funding ratio of 1:2 (GC:co-funding). Specifically, funding through the Genomic Applications Partnership Program (GAPP) has begun to pay dividends in attracting co-funding, in particular from the private sector and other users of genomics.
- Following the development of sector strategies, Genome Canada and the regional Genome Centres pursued ongoing consultation with sector stakeholders. Based on this process, Genome Canada designed and launched the **2014 Large-Scale Applied Research Project (LSARP) Competition Genomics and Feeding the Future** and initiated the development of



OBJECTIVES

the **2015 LSARP Competition *Natural Resources and the Environment: Sector Challenges – Genomic Solutions***. Both competitions are informed by sector and genomic user needs, ensuring that key economic drivers are targeted and that a focus is placed on areas with strong potential for translation into practical applications.

- Genome Canada continued to support the **International Barcode of Life (IBOL)** project, the largest biodiversity genomics initiative ever undertaken with the objective to construct a DNA barcode reference library of multi-cellular life on earth. The project – based at the University of Guelph under the leadership of Dr. Paul Hebert – has generated more than 4.5 million barcodes representing more than 420,000 species. Significant recent outcomes of the project include:
 - IBOL research was used in a new biosurveillance program initiated in summer 2014 in 55 Ontario provincial parks;
 - IBOL is undertaking work in Peru to develop barcoding capacity to support biodiversity conservation, sustainable harvesting and trade;
 - IBOL staff are providing barcode training to researchers in developing countries;
 - An iPhone application was released in July 2014 to encourage crowdsourcing the collection, analysis, and identification of biological samples based on DNA barcoding;
 - Catalyzed by Genome Canada investment in IBOL, new major investments in the project have been made by Germany, Austria, Norway and New Zealand, increasing international research collaboration.



- Genome Canada continued to support the **Structural Genomics Consortium** (SGC), an international public-private partnership that supports the discovery of new medicines through open access research. In February 2015, the SGC welcomed Merck as a member of the consortium. The SGC now comprises nine global pharmaceutical companies working in an open collaborative network with scientists at hundreds of universities around the world, under the leadership of University of Toronto-based Dr. Aled Edwards, founder and current CEO of the SGC. Outputs have been on track with project targets including a significant volume of peer-reviewed publications (more than 97 papers in 2014).
- Important progress was made on other initiatives that Genome Canada supports.
 - Canada remains a key player in the **International Rare Disease Research Consortium**, whose members have to date developed more than 140 new therapies for rare diseases, towards their goal of 200 by 2020. In 2014, Genome Canada was accepted into a new consortium (E-Rare 3) of international funders that will coordinate rare disease research funding through translational calls. The rare disease field has also been embraced by the Global Alliance for Genomics and Health as one that could demonstrate the value of being able to openly share genomic and clinical data across jurisdictions.
 - Genome Canada is a member of the **International Mouse Phenotyping Consortium** Steering Committee as a result of a GC-funded project focused on models for





human disease and drug discovery. Increased international coordination of mouse phenotyping research is advancing our understanding of human disease.

- The **Cancer Stem Cell Consortium**, with funding from Genome Canada and CIHR, have partnered with Stand Up To Cancer (SU2C) Canada to support a Dream Team to improve the outcomes of hard-to-treat cancers. A funding opportunity was launched in October 2014 with the decision on funding expected in July 2015.
- Genome Canada is a member of the **International Cancer Genome Consortium** Steering Committee as a result of a Genome Canada-funded project to stratify and target pediatric medulloblastoma through genomics. Canada is contributing towards improved cancer diagnosis and developing new cancer therapies.
- Genome Canada remains a partner in the **CIHR Research Catalyst Network on Rare Diseases**, whose goal is to establish a national consortium that will expedite collaboration between basic and clinical scientists in functional studies of novel rare disease genes. The Rare Diseases: Models and Mechanisms (RDMM) consortium has recently been approved and will mobilize the entire Canadian biomedical community of laboratory scientists and clinicians to communicate and connect, integrate and share resources and expertise, and work together to provide functional insights into newly-discovered rare disease genes. The work of the



2. **INVEST** in large-scale science and technology to fuel innovation

RDMM will lead to improved understanding of how specific gene mutations cause rare diseases, which will ultimately generate therapeutic leads and experimental approaches for further development.

- In November 2014, Genome Canada and CIHR launched the “**Sharing Big Data for HealthCare Innovation: Advancing the Objectives of the Global Alliance for Genomics and Health**” competition. This program will contribute to the mission of the Global Alliance, which is to accelerate progress in human health by helping to establish a common framework for harmonized approaches to enable effective and responsible sharing of genomic and clinical data, and by catalyzing data sharing projects that drive and demonstrate the value of data sharing. This will create new insights into disease, improve prevention and early detection, define diagnostic categories, streamline clinical trials, and match patient to therapy.

- Genome Canada’s ongoing investments in large-scale genomics research projects in Canadian research institutions are enhancing knowledge and building highly-qualified personnel in Canada in genomics research, including research into GE³LS (Genomics and its Ethical, Environmental, Economic, Legal and Social aspects). Our large-scale science investments include the following:

- **2014 Large-Scale Applied Research Project Competition – Genomics and Feeding the Future** – The Competition, launched in June 2014 in partnership with the Western





Grains Research Foundation, will focus on using genomic approaches within the agri-food and fisheries/aquaculture sectors. The projects will be selected based on their potential to address challenges and opportunities related to global food safety, security and sustainable production, thereby contributing to the Canadian bio-economy and the social and economic well-being of Canadians.

- **2012 Large-Scale Applied Research Project Competition – Genomics and Personalized Health** – Seventeen projects funded, many in partnership with CIHR, are progressing. The projects are contributing to more evidence-based approaches to health, cost-effectiveness for the healthcare system and benefits to patients in terms of tailored treatments and therapies across a spectrum of disease areas including epilepsy, autism, HIV/AIDS, cancer, cardiovascular disease, rare diseases and stroke, among others. For example, the team led by Dr. Stephen Scherer at SickKids in Toronto has discovered a “genetic formula” that will enable clinicians to identify genetic mutations that have the highest and lowest likelihood of causing Autism Spectrum Disorder.
- **GE³LS Third Modality** – As part of the 2012 LSARP on Genomics and Personalized Health, the Third Modality was introduced as a way to cross-fertilize and leverage the efforts of GE³LS research work across projects, address overarching research questions and facilitate the translation of research into practice and/or policy, as well as to address gaps in GE³LS research efforts that may require additional research attention. The Board decided that there would be two components to the Third Modality: the first being a Genomics and Personalized Health GE³LS Network and the second a Genomics and Personalized Health Impact Research Initiative funding opportunity.



- **2010 Large-Scale Applied Research Project Competition**

- Sixteen projects funded through this competition are concluding. The projects have advanced knowledge in forestry (e.g. using genomics to make Canada’s forests more sustainable and productive), environment (e.g. using genomic technology as an early warning system for problems in natural environments and watersheds, using plants to clean up pollutants), agriculture (e.g. improvements in livestock and crops) and health (e.g. new treatments for cancer and rare diseases). For instance, the team led by Dr. Richard Hamelin has found that the fungus *Mycosphaerella populorum* uses extra genes to produce a toxin that can cause fatal lesions on the leaves, stems and branches of poplar trees. The discovery aids detection and prevention of the disease from spreading.

- **Applied Genomics Research in Bio-Products or Crops Competition**

- The 12 projects funded through this competition since 2009 are coming to a close. They are expected to have significant impact in the fields of agriculture, bio-products and bio-energy. An evaluation of the program is underway.

- Genome Canada is working with a number of partners to address emerging issues such as the outbreak of Porcine Epidemic Diarrhea virus (funded projects are using genomic tools to develop novel vaccines and diagnosis), and the spread of *E.coli* and *Listeria* (genomic tools being developed and deployed for early detection to enhance consumer safety – see feature story on page 12). New partnerships are





OBJECTIVES

being formed to use genomics to address salient issues including avian bird flu and the impact of the Mount Polley mine tailings dam breach in British Columbia.

- On the technology side, Genome Canada has maintained support for the operations, research equipment, technology development and networking of five Science and Technology Innovation Centres for several years. In 2014-15, Genome Canada designed a new model to deliver cutting-edge technologies with a Genomics Innovation Network (GIN), comprised of 10 Nodes. The rationale for the new model is to allow innovation centres across Canada to collaborate and harness their collective power for the advancement of genomics research. A competitive process resulted in the decision for Genome Canada to invest \$15.5 million in core operational funding for the 10 Nodes, which are located in B.C., Alberta, Ontario and Quebec, as of April 1, 2015. The Nodes will obtain matching funds from various public and private sector partners. They will also be eligible for additional funding from Genome Canada in the coming two years for technology development and collaborative projects. (See further details on the GIN on page 25.)
- Genome Canada has invested in 17 projects since 2012 as part of the 2012 Bioinformatics and Computational Biology Competition, another partnership with CIHR. The outcomes of these projects will not only help support the development of next generation bioinformatics and computational biology tools and methodologies that will be required by the research community to deal with the influx of large amounts of data produced by modern genomics technologies, but will also provide broad



access to these tools and methodologies. These projects have great momentum and contribute knowledge to help researchers better understand the genetic basis for cancer mutations, among other areas.

- Genome Canada is part of an unprecedented partnership among federal funders including the Natural Sciences and Engineering Research Council (NSERC), CIHR and the Canada Foundation for Innovation to support a project (under NSERC's Advancing Big Data Science in Genomics Research initiative) that will develop new software tools that can effectively manipulate vast amounts of genetic data to help find cures for cancer. The unique initiative will bring together experts from a wide range of disciplines, including computer science, engineering, mathematics, machine learning, statistics, genomics, imaging, biophysics, structural genomics and other scientific disciplines.
- Genome Canada and CIHR are co-leading efforts to develop a National Bioinformatics and Computational Biology (B/CB) Strategy with the aim of developing a multi-year roadmap which details the current state and future opportunities in bioinformatics and computational biology. The strategy will ensure Canada's competitiveness in B/CB is coordinated, strengthened and sustained.
- Genome Canada is working toward the launch of a Disruptive Innovation in Genomics Initiative, whereby \$15 million is to be invested to enable the rapid acceleration of genomics research and its uptake through new application/commercialization opportunities.





3. **TRANSLATE**
discoveries into
applications to
maximize impact
across all sectors

- As Genome Canada's flagship translational initiative, the **Genomic Applications Partnership Program (GAPP)** is designed to increase collaboration between genomic scientists and users of genomics research, as well as to stimulate investment from private and public partners to fund projects that employ genomics to address real-world challenges and opportunities across multiple sectors. GAPP has completed three funding rounds with another two rounds anticipated in 2015. To date, 18 projects have been awarded and/or approved funding for which Genome Canada has committed \$22 million and leveraged \$55 million in co-funding for a total investment of \$77 million. The breadth of industry sectors interested in GAPP is noteworthy, with businesses from cheese-makers to foresters and diagnostic labs seeking the potential for genomics research to help overcome barriers, improve their products and services, and increase their competitive standing globally.
- Genome Canada is supporting programs to enhance researchers' entrepreneurial skills. A new partnership was formed with **Mitacs** to provide funding and training in an industry setting for graduate students and post docs who are part of GAPP projects. Further, projects funded through the **Entrepreneurship Education in Genomics (EEG)** Program, a pilot program launched in 2011, have been successful with laboratory presentations and coaching to educate on entrepreneurship, and with assistance in business plan development and advancing commercialization of life science research.





- Genome Canada continues to build presence and profile among stakeholders to build awareness about the value of genomics and the social and economic benefits investments in this area bring to Canadians. Notably, Genome Canada hosted its signature event in November 2014, **Genomics: The Power and The Promise**, in partnership with The Gairdner Foundation. The event attracted more than 350 participants, including visionaries and experts in genomics from across North America, to dialogue on cutting-edge advances in the field, particularly with respect to genomics and the environment.
- Genome Canada also organized a **GPS** (where **Genomics, Public Policy and Society meet**) event as part of the program of the 2014 Congress of the Humanities and Social Sciences. The event brought together experts with diverse perspectives to investigate the role of genomics in feeding the future, grounds for contesting and challenging the purely “science-based model” of regulatory evaluation, and policy options to foster transparency and strengthen engagement or to consider uncertainty in a new light. A policy brief based on dialogue at the session is forthcoming.
- In addition, Genome Canada generated considerable **media coverage** related to GAPP projects and the new Genomics Innovation Network, among other news stories. Relationships with stakeholders were strengthened through participation at a number of **key scientific and policy-oriented events** and through strategic sponsorships of events hosted by organizations with whom Genome Canada’s goals and objectives are aligned.



2014-2015 ACTIVE PROJECTS FUNDED

A RIGOROUS COMPETITIVE process determines which research projects and S&T Innovation Centres throughout Canada will be funded. Projects are selected through a system of peer review that includes an assessment of the scientific merit of the proposal and its potential socio-economic benefits for Canada, and a concurrent due diligence review of the proposed management structure, the proposed budget, and related financial data, including co-funding. Reviewers are chosen for their recognized expertise in the science, socio-economic benefits and management of large-scale genomics projects, and are drawn primarily from the international scientific community to avoid conflict of interest. Genome Canada's Board of Directors makes the final decision on which proposals to fund, based on recommendations received from the international panel of reviewers.

All Genome Canada funded projects are actively monitored through different mechanisms that depend on the nature of the funding program and type of projects. Typically, Research Oversight Committees are created for each funded large-scale research project, which assess the progress of the project, provide oversight and advice, and make recommendations regarding continued funding.

The following table lists active research projects in fiscal year 2014-2015. The table shows the overall project budget including the required co-funding and a column showing Genome Canada's contribution.

LARGE-SCALE SCIENCE					
CENTRE	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
LARGE-SCALE APPLIED RESEARCH PROJECTS					
Genome Alberta	Agriculture	Facchini, Peter Martin, Vincent	Synthetic Biosystems for the Production of High-Value Plant Metabolites	\$13,602,100	\$6,443,096
Genome Alberta	Agriculture	Plastow, Graham Harding, John Kemp, Bob	Application of Genomics to Improve Swine Health and Welfare	\$12,480,746	\$4,899,109
Genome Alberta	Agriculture	Miller, Stephen	Whole Genome Selection through Wide Imputation in Beef Cattle	\$8,241,118	\$3,860,664
Genome Prairie	Agriculture	Rowland, Gordon Cloutier, Sylvie	Total Utilization Flax GENomics (TUFGEN)	\$11,785,159	\$5,645,463
Genome Prairie	Agriculture	Pozniak, Curtis Hucl, Pierre	Canadian Triticum Advancement through Genomics (CTAG)	\$8,506,826	\$4,102,385
Ontario Genomics Institute	Agriculture	Grbic, Miodrag	Genomics in Agricultural Pest Management (GAP-M)	\$6,312,890	\$2,789,939

CENTRE	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
Génome Québec	Agriculture	Bureau, Thomas	Bridging comparative, population and functional genomics to identify and experimentally validate novel regulatory regions and genes for crop improvement	\$4,658,937	\$2,199,182
Genome British Columbia	Energy	Douglas, Carl Mansfield, Shawn	POPCAN: Genetic improvement of poplar trees as a Canadian feedstock	\$9,857,823	\$4,879,622
Genome Alberta	Energy	Voordouw, Gerrit	Metagenomics for Greener Production and Extraction of Hydrocarbon Energy	\$11,259,518	\$5,033,698
Genome Prairie	Energy	Levin, David Sparling, Richard	Microbial Genomics for Biofuels and Co-products from Biorefining Processes	\$10,574,799	\$4,877,146
Genome British Columbia	Environment	Eltis, Lindsay Mohn, William	Harnessing microbial diversity for sustainable use of forest biomass resources	\$7,830,841	\$3,869,964
Genome British Columbia	Environment	Tang, Patrick Isaac-Renton, Judith	Applied Metagenomics of the Watershed Microbiome	\$3,203,985	\$1,582,765
Ontario Genomics Institute	Environment	Edwards, Elizabeth Major, David	BEEM: Bioproducts and Enzymes from Environmental Metagenomes	\$10,987,649	\$5,090,990
Ontario Genomics Institute	Environment	Hajjibabaei, Mehrdad	Biomonitoring 2.0: A high-throughput genomics approach for comprehensive biological assessment of environmental change	\$3,129,612	\$1,556,879
Génome Québec	Environment	Tsang, Adrian	Genozymes for Bioproducts and Bioprocesses Development	\$17,422,937	\$8,138,853
Génome Québec	Environment	Lang, B. Franz Hijri, Mohamed	Improving Bioremediation of polluted soils through Environmental Genomics	\$7,655,762	\$3,789,354
Genome British Columbia	Forestry	Aitken, Sally Hamann, Andreas	AdapTree: Assessing the adaptive portfolio of reforestation stocks for future climates	\$4,703,158	\$2,320,251
Genome British Columbia	Forestry	Hamelin, Richard	Genomics-Based Forest Health Diagnostics and Monitoring	\$4,250,116	\$2,055,554
Génome Québec Co-lead with Genome British Columbia	Forestry	MacKay, John Bohlmann, Joerg	SMarTForest : Spruce Marker Technologies for Sustainable Forestry	\$10,306,959	\$4,880,948
Genome Alberta	GE ³ LS	McCabe, Christopher Bubela, Tania	PACE - `Omics: Personalized, Accessible, Cost-Effective applications of `Omics technologies	\$4,502,084	\$1,049,258
Genome Prairie	GE ³ LS	Phillips, Peter Castle, David	Value Addition to Genomics and GE ³ LS (VALGEN)	\$5,427,700	\$2,553,659
Génome Québec Co-lead with Genome British Columbia	GE ³ LS	Rousseau, Francois Langlois, Sylvie	PEGASUS: PErsonalized Genomics for prenatal Aneuploidy Screening USing maternal blood	\$10,459,742	\$2,409,070
Genome British Columbia Co-lead with Ontario Genomics Institute	Health	Taylor, Michael Malkin, David Marra, Marco	Stratifying and Targeting Pediatric Medulloblastoma Through Genomics	\$9,856,814	\$4,847,669
Genome British Columbia	Health	Connors, Joseph Marra, Marco Gascoyne, Randy	141LYM - Personalized Treatment of Lymphoid Cancer: British Columbia as Model Province	\$9,920,003	\$2,420,000
Genome British Columbia	Health	Harrigan, Richard Montaner, Julio	142HIV - Viral and Human Genetic Predictors of Response to HIV Therapies	\$4,758,743	\$1,103,367
Genome British Columbia Co-lead with Genome Alberta	Health	Penn, Andrew Borchers, Christoph Coutts, Shelagh	143TIA - Reducing Stroke Burden with Hospital-Ready Biomarker Test for Rapid TIA Triage	\$9,634,996	\$4,755,969

CENTRE	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
Genome British Columbia	Health	Sin, Don Ng, Raymond	144COP - Clinical Implementation and Outcomes Evaluation of Blood-Based Biomarkers for COPD Management	\$7,100,000	\$1,700,000
Ontario Genomics Institute	Health	McKerlie, Colin Brown, Steve	NorCOMM2 - In vivo models for human disease & drug discovery	\$10,886,280	\$4,900,000
Ontario Genomics Institute	Health	Sidhu, Sachdev Boone, Charles	Synthetic antibody program: novel therapeutics and reagents	\$9,877,596	\$4,849,415
Ontario Genomics Institute	Health	Scherer, Stephen Szatmari, Peter	Autism Spectrum Disorders: Genome to Outcomes	\$9,979,998	\$2,479,999
Ontario Genomics Institute	Health	Stein, Lincoln Godfrey, Tony	Early detection of patients at high risk of esophageal adenocarcinoma	\$3,240,865	\$795,272
Genome British Columbia	Health	Boycott, Kym MacKenzie, Alex	Enhanced CARE for RARE Genetic Diseases in Canada	\$11,778,890	\$2,425,000
Ontario Genomics Institute	Health	Stintzi, Alain Mack, Dave	The Microbiota at the Intestinal Mucosa-Immune Interface: A gateway for personalized health	\$2,961,445	\$716,360
Génome Québec	Health	Rioux, John D Bitton, Alain	IBD Genomic Medicine Consortium (iGenoMed): translating genetic discoveries into a personalized approach to treating the inflammatory bowel diseases	\$9,892,162	\$2,386,180
Génome Québec	Health	Sauvageau, Guy Hébert, Josée	Innovative chemogenomic tools to improve outcome in acute myeloid leukemia	\$11,325,631	\$4,908,515
Génome Québec	Health	Simard, Jacques Knoppers, Bartha Maria	Personalised Risk Stratification for Prevention and Early Detection of Breast Cancer	\$11,382,432	\$2,353,481
Génome Québec	Health	Perreault, Claude Roy, Denis-Claude	Personalized Cancer Immunotherapy	\$13,486,784	\$2,409,386
Génome Québec	Health	Cossette, Patrick Michaud, Jacques Minassian, Berge	Personalized medicine in the treatment of epilepsy	\$10,833,259	\$4,909,616
Génome Québec	Health	Tardif, Jean-Claude Dubé, Marie-Pierre	Personalized medicine strategies for molecular diagnostics and targeted therapeutics of cardiovascular diseases	\$9,443,002	\$4,672,882
Génome Québec	Health	Jabado, Nada Majewski, Jacek Pastinen, Tomi	The ICHANGE (International Childhood Astrocytomas iNtegrated Genomics and Epigenomics) Consortium	\$5,074,852	\$1,183,123
Genome Atlantic	Health	McMaster, Christopher Fernandez, Conrad	Identifying New Genes and Medicines for the Treatment of Orphan Diseases (IGNITE)	\$4,880,973	\$2,393,299
NATIONAL AND INTERNATIONAL INITIATIVES					
Ontario Genomics Institute	Environment	Hebert, Paul	International Barcode of Life Project (IBOL) (3 years)	\$22,895,657	\$7,335,002
Ontario Genomics Institute	Health	Edwards, Aled	Structural Genomics Consortium III (4 years)	\$81,026,000	\$10,000,000
Genome Alberta	Health	Cairncross, Gregory	Modeling and Therapeutic Targeting of the Clinical and Genetic Diversity of Glioblastoma	\$8,178,786	\$612,001
Ontario Genomics Institute	Health	Dick, John	Development of Highly Active Anti-Leukemia Stem Cell Therapy Project	\$32,155,381	\$11,500,000
Ontario Genomics Institute	Health	Mak, Tak	Therapeutic Opportunities to Target Tumor Initiating Cells in Solid Tumors	\$39,974,996	\$2,500,000

CENTRE	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
EMERGING ISSUES					
Genome Alberta	Agriculture	Bergeron, Michel Blais, Burton	Point-of-Need Gene-Based System for Detection of Priority STEC in Beef	\$1,032,780	\$125,000
Genome Alberta	Agriculture	Pilarski, Linda McMullen, Lynn	Sampling and Detection of STEC in Meat	\$726,000	\$125,000
Genome Alberta	Agriculture	Zakhartchouk, Alexander Gerds, Volker	Development of a new generation of modified live virus vaccine for PEDv using reverse genetics system	\$347,750	\$118,572
Genome Alberta	Agriculture	Harding, John Alexandersen, Soren	Enhanced molecular diagnostics and validating genetic resistance to PEDv in pigs	\$250,500	\$118,928
Genome British Columbia	Environment	Fraser, Lauchlan Baldwin, Sue	Metagenomics to assess impacts of the Mount Polley Mine tailings dam breach on associated ecosystems	\$286,400	\$63,134
Genome Alberta	Health	Chui, Linda Zhang, Jian Pagotto, Franco	Listeria Detection and Surveillance using Next Generation Genomics (LiDS-NG)	\$1,461,774	\$249,936
Genome British Columbia	Health	Hieter, Philip Boycott, Kym Rossant, Janet	Canadian "Rare Diseases: Models & Mechanisms" Network	\$2,300,000	\$200,003
TOTAL				\$544,111,210	\$173,184,958

LEADING-EDGE TECHNOLOGY

CENTRE	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
SCIENCE AND TECHNOLOGY INNOVATION CENTRES					
Genome British Columbia	All	Borchers, Christoph	University of Victoria - Genome BC Proteomics Core Facility (UVic-GBC PCF)	\$4,295,881	\$4,295,881
Genome British Columbia	All	Marra, Marco Jones, Steven Holt, Rob	Genome Sciences Centre (GSC)	\$8,668,689	\$8,668,682
Genome Alberta	All	Wishart, David Borchers, Christoph	The Metabolomics Innovation Centre (TMIC)	\$1,739,178	\$1,739,169
Ontario Genomics Institute	All	Scherer, Stephen	The Centre for Applied Genomics (TCAG)	\$4,032,353	\$4,032,350
Génome Québec	All	Lathrop, Mark	McGill University / Génome Québec Innovation Centre	\$9,830,429	\$9,830,426

CENTRE	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
TECHNOLOGY RESEARCH					
Ontario Genomics Institute	Agriculture	Lukens, Lewis Griswold, Cortland	Applying genomic signal processing methods to accelerate crop breeding	\$220,000	\$220,000
Ontario Genomics Institute	Agriculture	Provar, Nicholas Wright, Stephen	Large Data Sets and Novel Tools for Plant Biology for use in International Consolidation – Tier Data Repositories and Portals	\$999,996	\$499,998
Génomique Québec	Agriculture	Blanchette, Mathieu Bureau, Thomas	PIATEA: A portal for integrative approaches to transportable element annotation	\$249,915	\$62,479
Genome Atlantic	Agriculture	Myles, Sean	Exploiting the full potential of next generation DNA sequencing for crop improvement	\$249,176	\$249,176
Genome British Columbia	Health	Sahinalp, Cenk Collins, Colin	A compressed sensing framework for identifying differentially expressed isoforms and transcriptomic aberrations in cancer samples	\$249,252	\$62,312
Genome British Columbia	Health	Brinkman, Fiona Van Domselaar, Gary Hsiao, William	A federated bioinformatics platform for public health microbial genomics	\$1,562,534	\$499,108
Genome British Columbia	Health	Wasserman, Wyeth	Applied Bioinformatics of Cis-regulation for Disease Exploration (ABC4DE)	\$1,000,000	\$500,000
Genome British Columbia	Health	Shah, Sohrab Boutros, Paul	Computational interpretation of cancer genomes: defining mutational landscapes for translational genomics	\$999,759	\$499,547
Genome British Columbia	Health	Shah, Sohrab	Measuring and modeling tumour evolution from next generation sequencing data: enabling clinical study of clonal diversity in cancer patients	\$249,684	\$102,213
Genome British Columbia	Health	Biol, Inanc Jones, Steven Karsan, Aly	Next Generation Bioinformatics for Clinical Genomics: using de novo assembly in personalized medicine	\$999,864	\$499,928
Genome British Columbia	Health	Gsponer, Joerg	Tool for proteome-wide identification of regulatory switches	\$214,940	\$53,734
Ontario Genomics Institute	Health	Lerner-Ellis, Jordan Lebo, Matthew	Development of a unified Canadian clinical genomic database as a community resource for standardizing and sharing genetic interpretations	\$1,000,000	\$500,000
Ontario Genomics Institute	Health	Parkinson, John	Leveraging Meta-Transcriptomics for Functional Interrogation of Microbiomes	\$249,951	\$87,483
Ontario Genomics Institute	Health	Brudno, Michael Bader, Gary	MedSavant: An integrative framework for clinical and research analysis of human genomes	\$998,546	\$499,273
Ontario Genomics Institute	Health	Stein, Lincoln	Pathway and Network Visualization for Personal Genomes	\$249,999	\$62,499
Ontario Genomics Institute	Health	Gingras, Anne-Claude Tyers, Mike	ProHits Next Generation: A flexible system for tracking, analyzing and reporting functional proteomics data	\$1,000,000	\$250,000
Génomique Québec	Health	Waldispuhl, Jerome Blanchette, Mathieu	A Development and Deployment Platform for Citizen Science Games in Genomics	\$249,318	\$62,330
Ontario Genomics Institute	Health	Stein, Lincoln	Advancing Big Data Science in Genomics Research project - The Cancer Genome Collaboratory	\$5,999,861	\$2,000,000
TOTAL				\$45,309,325	\$35,276,588

TRANSLATION

CENTRE	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
GAPP					
Génome Québec	Agriculture	Labrie, Steve Duquenne, Manon	A Metagenomic Approach to Evaluate the Impact of Cheesemaking Technologies and Ripening Conditions on the Microbial Ecosystem of Premium Washed Rind Cheeses	\$742,679	\$247,472
Ontario Genomics Institute	Agriculture	Yoshioka, Keiko Somers, Daryl	Genomics for a Competitive Greenhouse Vegetable Industry	\$2,416,624	\$802,648
Genome Prairie	Agriculture	Vujanovic, Vladimir Maltzahn, Geoffrey von	Augmenting the Plant Microbiome to Improve Crop Yield and Stress Resilience	\$16,143,997	\$1,943,373
Génome Québec	Agriculture	Tsang, Adrian Matzat, Paul	Development and Commercialization of Next Generation Enzyme Supplement for Swine and Poultry	\$6,000,000	\$2,000,000
Genome Atlantic	Fisheries	Rise, Matthew Taylor, Richard	Biomarker Platform for Commercial Aquaculture Feed Development	\$3,804,456	\$1,093,988
Genome Atlantic Co-lead with Ontario Genomics Institute	Fisheries	Boulding, Elizabeth Ang, Keng Pee	SALMON and CHIPS – Commercial Application of Genomics to Maximize Genetic Improvement of Farmed Atlantic Salmon on the East Coast of Canada	\$3,797,736	\$1,265,930
Genome British Columbia Co-lead with Génome Québec	Forestry	Hamelin, Richard Duff, Cameron	Protecting Canada's Forests against Invasive Alien Species by Next Generation Biosurveillance	\$2,430,000	\$810,000
Ontario Genomics Institute	Health	Liu, Peter Bucklar- Suchankova, Gabriela	Cardiovascular Biomarker Translation (CBT) Program	\$5,904,662	\$1,953,663
Ontario Genomics Institute	Health	Kennedy, James C. Altar, Anthony	Clinical Utility and Enhancements of a Pharmacogenomic Decision Support Tool for Mental Health Patients	\$5,994,758	\$1,981,184
Ontario Genomics Institute	Health	Dumont, Dan Van Slyke, Paul	Developing Vasculotide, a genomic/proteomic derived treatment to target vascular inflammation and destabilization	\$1,500,003	\$500,001
Ontario Genomics Institute	Health	Kelley, Shana Jack, Graham	Development of low cost diagnostic platform for infectious disease testing	\$5,976,619	\$1,979,494
Genome British Columbia	Health	Borchers, Christoph Kruppa, Gary	Development of Disease Biomarker Assessment Assays and Kits for Targeted Quantitative Proteomics of Mouse Plasma by Mass Spectrometry	\$1,238,513	\$412,637
ENTREPRENEURSHIP EDUCATION					
Genome British Columbia	Health	Livingstone, Angus Muzyka, Daniel	Genomics Research Entrepreneurship to Accelerate Translation (GREAT)	\$979,964	\$408,788
Génome Québec	Health	Garant, Denis	Boosting Entrepreneurial Skills and Training: BEST in Genomics	\$1,215,462	\$401,442
TOTAL				\$58,145,473	\$15,800,620

Projects listed include those for which funds flowed during fiscal year 2014-2015.

GENOME CENTRE SUPPORT

GENOME CANADA delivers its mandate by funding and managing large-scale, interdisciplinary and internationally peer-reviewed research projects, leading-edge technology and programs that support the translation of research into applications as well as sound practice and policy. This is achieved by working with our primary partners: the six regional Genome Centres. The relationship between Genome Canada and each Genome Centre is defined by means of a funding agreement that acknowledges the independence of each Centre and the way in which each contributes to Genome Canada's overall mandate.

The Genome Centres play a significant role in fostering regional expertise in genomics research, developing partnerships to strengthen regional leadership and competitiveness, facilitating researcher access to the Science and Technology Innovation Centres, creating unique and innovative public outreach programs, and most importantly, securing co-funding for projects from both domestic and international investors. As recipients of Genome Canada funding, the Genome Centres are subject to regular external assessments.

The following table shows funding to Centres for the 2014-2015 fiscal year.

GENOME CENTRES SUPPORT FUNDING			
CENTRE	PRESIDENT AND CEO	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
Genome Atlantic	Armstrong, Steve	\$1,469,600	\$734,800
Génome Québec	Lepage, Marc	\$1,760,000	\$880,000
Ontario Genomics Institute	Poznansky, Mark	\$1,760,000	\$880,000
Genome Prairie	Pontarollo, Reno	\$1,469,600	\$734,800
Genome Alberta	Bailey, David	\$1,469,600	\$734,800
Genome British Columbia	Winter, Alan	\$1,760,000	\$880,000
TOTAL		\$9,688,800	\$4,844,400

NOTES ON GOVERNANCE

GENOME CANADA is governed by a Board of Directors comprised of no less than nine, but not more than 16 directors, recruited from the academic, private and public sectors. New directors are appointed for two-year terms, which are renewable. The presidents of each of the following organizations — the Canada Foundation for Innovation, Canadian Institutes of Health Research, National Research Council, Natural Sciences and Engineering Research Council, and Social Sciences and Humanities Research Council — are non-voting, ex officio advisors to the Board.

The Board has stewardship over the business and affairs of Genome Canada. Its fiduciary responsibilities include strategic leadership, succession planning, risk mitigation, performance and evaluation, and financial oversight. A number of permanent committees assist the board in fulfilling its duties, namely: an Executive Committee, an Audit and Investment Committee, a Governance, Election and Compensation Committee, and a Programs Committee. As well, the Board has in place a Science and Industry Advisory Committee that provides advice to the Board on approaches and directions that contribute to the achievement of Genome Canada's strategic plan.

NUMBER OF MEETINGS HELD BY THE BOARD AND ITS COMMITTEES IN 2014-15

Board of Directors	6
Audit and Investment Committee	5
Governance, Election and Compensation Committee	4
Programs Committee	5
Science and Industry Advisory Committee	6

BOARD AND MANAGEMENT



JEAN-MARC CARBISSE

Board of Directors, back row (LEFT TO RIGHT): Kim McConnell, Yvan Hardy, Barbara Wold, René Douville, Janice Lederman, Jean Brunet (Secretary), Pierre Meulien (President and CEO). Front row (LEFT TO RIGHT): Moura Quayle (Vice-Chair), Lorne Hepworth (Chair), Fiona Brinkman. *Not shown:* Abdallah Daar, Clarissa Desjardins, Jay Ingram, Robert Orr, George Weinstock and Donald Ziraldo

BOARD OF DIRECTORS

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(Chair)
Past President
CropLife Canada
Ottawa, Ontario

Moura Quayle
(Vice-Chair)
Director
Liu Institute for Global Issues
University of British
Columbia
Vancouver, British Columbia

Fiona Brinkman
Professor of Molecular Biology
and Biochemistry
Simon Fraser University
Burnaby, British Columbia

Abdallah Daar
Professor of Public Health
Sciences and Professor of Surgery
University of Toronto
Toronto, Ontario

Clarissa Desjardins
President and CEO
Clementia Pharmaceuticals
Montreal, Québec

René Douville
Managing Director, National
Client Group
RBC Royal Bank
Montreal, Québec

Yvan Hardy
Panel Member, International
Resource Panel for
Sustainable Resource
Management
Ottawa, Ontario

Jay Ingram
Broadcaster and Science Writer
Bragg Creek, Alberta



Genome Canada's management team (LEFT TO RIGHT): Pierre Meulien, Cindy Bell, Karl Tibelius, Darlene Arseneau, Paul-Émile Cloutier, Carol Anne Esnard

Janice Y. Lederman

Partner
Thompson Dorfman Sweatman
LLP
President
Innovate Manitoba Inc.
Winnipeg, Manitoba

Kim McConnell

Founder and Former CEO
AdFarm
Calgary, Alberta

Pierre Meulien

President and CEO
Genome Canada
Ottawa, Ontario

Robert Orr

President and CEO
Slamhor Pharmaceutical Inc.
Bedford, Nova Scotia

George Weinstock

Professor
The Jackson Laboratories
for Genomic Medicine
Farmington, Connecticut, USA

Barbara Wold

Bren Professor of Microbiology
California Institute of Technology
Pasadena, California, USA

Donald Ziraldo

Co-founder
Inniskillin Wines
St. Catharines, Ontario

EX OFFICIO ADVISORS

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President
Canadian Institutes of Health
Research
Ottawa, Ontario

John R. McDougall

President
National Research Council Canada
Ottawa, Ontario

B. Mario Pinto

President
Natural Sciences and Engineering
Research Council of Canada
Ottawa, Ontario

Ted Hewitt

President
Social Sciences and Humanities
Research Council of Canada
Ottawa, Ontario

Gilles G. Patry

President and CEO
Canada Foundation for Innovation
Ottawa, Ontario

**SCIENCE AND INDUSTRY
ADVISORY COMMITTEE**

Jacques Simard

(Chair)
Professor, Canada Research Chair
in Oncogenetics
Faculty of Medicine
Université Laval
Deputy Director, Basic Research
CHU de Québec Research Centre
Québec City, Québec

Anne-Christine Bonfils

Research Program Manager
Vice-President's Office – Life Sciences
National Research Council Canada
Ottawa, Ontario

Doane Chilcoat

Director, Applied Technology Systems
DuPont Pioneer
Johnston, Iowa, USA

David J. Drutz

President
Pacific Biopharma Associates, LLC
Chapel Hill, NC, USA

Stacey B. Gabriel

Director, Genomics Platform
Broad Institute of MIT and Harvard
Cambridge, MA, USA

Joan Lunney

Research Scientist
Beltsville, MD, USA

Eric M. Meslin

Director, Center for Bioethics
Professor of Bioethics and Associate
Dean, School of Medicine
Indiana University
Indianapolis, IN, USA

Francis Ouellette

Associate Director, Senior Scientist,
Informatics and Bio-computing
Ontario Institute for Cancer Research
Toronto, Ontario

Dan Roden

Assistant Vice-Chancellor for
Personalized Medicine
Vanderbilt University
Nashville, TN, USA

Jean Weissenbach

Director, Centre National de
Séquençage
Paris, France

Paul A. Willems

Technology Vice-President,
Energy Biosciences, BP Group
Associate Director, Energy
Biosciences Institute, UC Berkeley
Berkeley, CA, USA

OFFICERS**Lorne Hepworth**

Chair

Moura Quayle

Vice-Chair

Jean Brunet

Stein Monast L.L.P.
Secretary

Darlene Arseneau

Vice-President, Corporate
Services and CFO

Cindy Bell

Executive Vice-President,
Corporate Development

Paul-Émile Cloutier

Vice-President, Advocacy and
External Relations

Guy D'Aloisio

(until January 2015)
Vice-President, Finance

Carol Anne Esnard

Chief Administrative Officer

Pierre Meulien

President and CEO

Karl Tibelius

Vice-President, Genomics Programs

GENOME CANADA STAFF**Pierre Meulien**

President and CEO

Koko Agborsangaya

Program Manager

Darlene Arseneau

Vice President, Corporate
Services and CFO

Naveed Aziz

Director, Technology Programs

Cindy Bell

Executive Vice-President,
Corporate Development

Kim Corbett

(on maternity leave)
Program Manager

Paul-Émile Cloutier

Vice-President, Advocacy and
External Relations

Guy D'Aloisio

(until January 2015)
Vice-President, Finance

Karen Dewar

Director, Genomics Programs

Carol Anne Esnard

Chief Administrative Officer

Julie Edwards

Director, Corporate Development

Samantha Evans

Director, Evaluation

Lorna Jackson

Program Manager

Andrea Matyas

Director, Communications

Stephanie McDuff

(until October 2014)
Administrative Assistant

Hélène Meilleur

Director, Events and Sponsorships

Michael Midmer

Director, Genomic Applications
Programs

Jessica Montpellier

Administrative Assistant

Karine Morin

(until November 2014)
Director, National GE³LS Program

Kate Swan

(on leave of absence)
Assistant Director, Genomics
Programs

Helina Tadesse

Program Manager

Normand Therrien

Director, Project Finance

Karl Tibelius

Vice-President, Genomics
Programs

Rob Tweedy

Director, Information Services

Brigitte Vaillant

Executive Assistant to the
President and CEO



STATEMENT OF REMUNERATION

BOARD OF DIRECTORS AND MEMBERS

Directors and Members do not receive any remuneration for their services. However, Genome Canada pays the expenses incurred by Directors in the performance of their duties

OFFICERS AND EMPLOYEES

Genome Canada has a compensation policy that includes job classifications and related salary ranges. The policy applies to all officer and employee positions of Genome Canada except the position of President and CEO. Genome Canada officers and employees are eligible for performance awards ranging from zero to 25 per cent. For positions which exceeded \$100,000 in the year ended March 31, 2015 the following are the annual salary ranges:

OFFICERS

President and CEO	\$305,000-\$426,500
Executive Vice-President, Corporate Development	\$129,356-\$194,034
Vice-President, Genomics Programs	\$129,356-\$194,034
Vice-President, Advocacy and External Relations	\$129,356-\$194,034
Vice-President, Finance	\$129,356-\$194,034
Chief Administrative Officer	\$129,356-\$194,034

EMPLOYEES

Director, Genomics Programs	\$100,521-\$150,782
Director, Technology Programs	\$100,521-\$150,782
Director, Genomic Applications Programs	\$100,521-\$150,782
Director, National GE ³ LS Program	\$100,521-\$150,782
Director, Evaluation	\$100,521-\$150,782
Director, Events and Sponsorships	\$78,114-\$117,171
Director, Communications	\$78,114-\$117,171
Director, Project Finance	\$78,114-\$117,171



MANAGEMENT DISCUSSION

SINCE GENOME CANADA'S creation in 2000, the federal government has formally committed \$1.2 billion to the organization for the purpose of supporting genomics research, the most recent allocation being \$165 million, which was announced in the federal Budget 2013, and for which a funding agreement was signed by Genome Canada and Industry Canada in March 2014. This and previous agreements provide funding to support the regional Genome Centres, large-scale research projects, Science and Technology Innovation Centres, and the operations of Genome Canada.

All research projects, with a few exceptions, require co-funding from other parties, including provinces, universities, the private sector, and other national and international organizations. As of March 2015, more than \$1.4 billion in co-funding had been raised.

Prior to the Funding Agreement signed March 2014, the funding ratio of Genome Canada to co-funding was 1:1. Under the Funding Agreement of March 2014 the required funding ratio is increased to approximately 1:2 with \$280 million in co-funding required for the \$165-million federal investment.

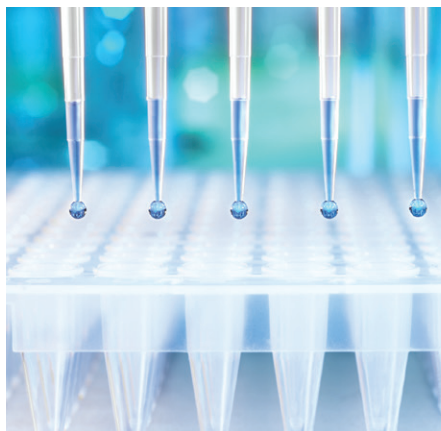
Guided by the terms and conditions of the funding agreements with each of the six Genome Centres, Genome Canada disburses funds to each for approved projects and technology platforms. In turn, each Centre directs the funds to individual projects and to the Science and Technology Innovation Centre located within its region. Genome Canada also contributes to the funding of base operations of the Genome Centres.



FINANCIAL HIGHLIGHTS

2014-2015

In the year ending March 31, 2015, Genome Canada dispersed a total of \$65.8 million for the funding of projects, Science and Technology Innovation Centres, Genome Centres and its own operations, in comparison to \$75 million dispersed in fiscal year 2013-2014, with prior competitions winding down.



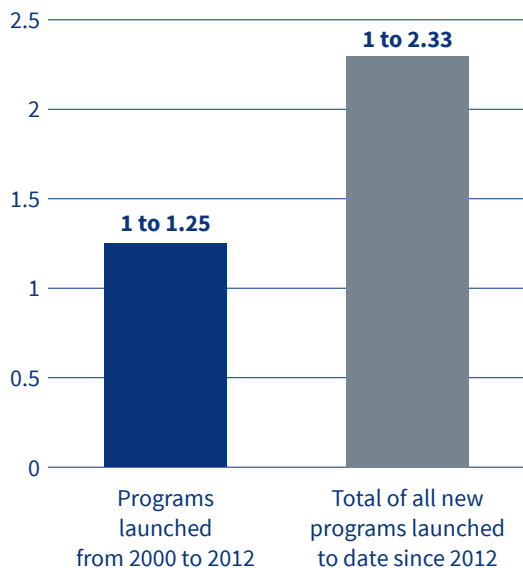
OPERATIONS

- Genome Canada's cost of operations totals \$5.9 million to support operational activities in the areas of program management, corporate development and fundraising, communications, governance, evaluation and performance, Genomics in Society activities and administration.

PROJECTS, SCIENCE AND TECHNOLOGY INNOVATION CENTRES, AND GENOME CENTRES

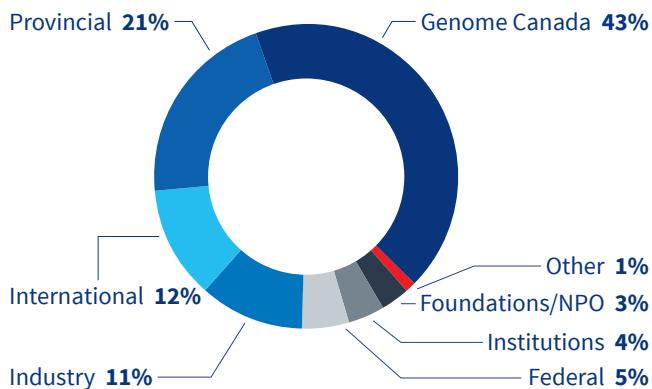
- From inception to March 31, 2015, Genome Canada disbursements for research projects, Science and Technology Innovation Centres, and regional Genome Centre operations total \$981.1 million.
- From total disbursements of \$59.9 million in fiscal year 2014-2015, \$41.2 million was in support of research projects, \$13.9 million for the Science and Technology Innovation Centres, and \$4.8 million for base funding of the regional Genome Centres.
- As of March 31, 2015, a total of \$29.5 million remains as deferred contributions, representing disbursements that will be made in subsequent years for Genome Canada operations and for approved research projects and technology platforms (i.e. GIN Nodes).
- Through the combined efforts of Genome Canada, Genome Centres, and project leaders, more than \$1.41 billion in co-funding has been raised and committed from inception to March 31, 2015, bringing the total committed value of investments in genomics research through Genome Canada funded projects and initiatives to \$2.5 billion.

OUR CO-FUNDING RATIO IS INCREASING



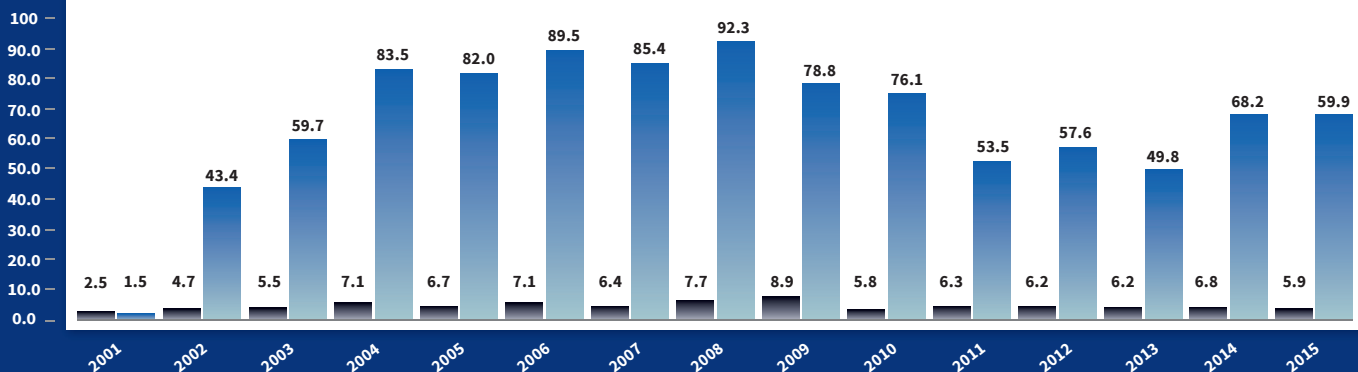
INVESTMENT BY GENOME CANADA AND CO-FUNDING BY PARTNERS SINCE 2000

Figures from March 2015



Funding by Genome Canada = \$1.1 Billion
 Co-Funding by Partners = \$1.4 Billion
Total Investment in Genomics = \$2.5 Billion

Annual Expenditures in Millions of Dollars





FINANCIAL OUTLOOK

2015-2016

THE MOST RECENT FUNDING agreement with Industry Canada for \$165 million signed in March 2014 includes funding for projects and operations into future fiscal periods. The operations of Genome Canada and the Genome Centres are funded to March 31, 2017. Research projects and competitions will continue to be conducted in 2015-2016 including funding opportunities for large-scale research projects, disruptive innovation and GAPP.

Funding from Industry Canada is provided to Genome Canada in annual installments based on estimated cash requirements for the year. Under currently active funding agreements, an amount of \$67.4 million is expected to be received in 2015-2016 to fund already approved research projects and operations.

Deferred contributions of \$29.5 million as of March 31, 2015, are committed to research projects approved through previous competitions and are scheduled for disbursement in 2015-2016 and subsequent fiscal years.

Financial statements of

Genome Canada

March 31, 2015

Genome Canada

March 31, 2015

Table of contents

Independent Auditor's Report	1-2
Statement of financial position	3
Statement of operations and changes in net assets	4
Statement of cash flows	5
Notes to the financial statements	6-10



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Ottawa ON K1P 5T8
Canada

Tel: (613) 236-2442
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Independent Auditor's Report

To the Directors of
Genome Canada

We have audited the accompanying financial statements of Genome Canada, which comprise the statement of financial position as at March 31, 2015, and the statements of operations and changes in net assets and of cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian accounting standards for not-for-profit organizations, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements present fairly, in all material respects, the financial position of Genome Canada as at March 31, 2015, and the results of its operations and its cash flows for the year then ended in accordance with Canadian accounting standards for not-for-profit organizations.



Chartered Professional Accountants, Chartered Accountants
Licensed Public Accountants

June 19, 2015

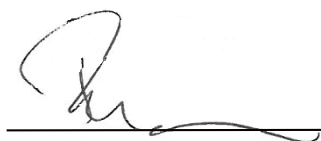
Genome Canada

Statement of financial position as at March 31, 2015

(in thousands of dollars)

	2015	2014
	\$	\$
Assets		
Current assets		
Cash and cash equivalents (Note 3)	26,815	25,645
Interest receivable	-	23
Other receivables	112	149
Prepaid expenses	165	195
	27,092	26,012
Investments (Note 4)	2,999	-
Capital assets (Note 5)	159	25
	30,250	26,037
Liabilities		
Current liabilities		
Accounts payable and accrued liabilities	634	829
Deferred contributions (Note 6)	29,457	25,183
Deferred contributions related to capital assets (Note 7)	159	25
	30,250	26,037
Commitments (Note 10)		
Contingencies (Note 11)		
Net assets	-	-
	30,250	26,037

On behalf of the Board



Director



Director

See accompanying notes to financial statements

Genome CanadaStatement of operations and changes in net assets
year ended March 31, 2015

(in thousands of dollars)

	2015	2014
	\$	\$
Revenues		
Amortization of deferred contributions (Note 6)	65,786	74,956
Amortization of deferred contributions related to capital assets (Note 7)	17	10
	65,803	74,966
Expenses		
Contributions to Centres and approved projects	59,888	68,165
General and administrative	4,564	4,515
Communications	502	472
Program management	316	452
Governance	147	129
Corporate development	118	171
Government relations	80	94
Genomics in Society	64	158
Evaluation	55	293
Workshops and symposia	52	507
Amortization of capital assets	17	10
	65,803	74,966
Excess of revenues over expenses, being net assets, end of year	-	-

See accompanying notes to financial statements

Genome Canada

Statement of cash flows

year ended March 31, 2015

(in thousands of dollars)

	2015	2014
	\$	\$
Net inflow (outflow) of cash and cash equivalents related to the following activities:		
Operating		
Excess of revenues over expenses	-	-
Items not affecting cash		
Amortization of capital assets	17	10
Change in fair value of investments	57	(285)
Amortization of deferred contributions (Note 6)	(65,786)	(74,956)
Amortization of deferred contributions related to capital assets (Note 7)	(17)	(10)
Excluded from the increase in deferred contributions (Note 9)	(161)	(102)
	(65,890)	(75,343)
Interest received on investments	382	916
Grants received from Government of Canada (Note 6)	69,800	56,600
Deferred contributions related to capital assets	151	-
Change in operating assets and liabilities:		
Decrease (increase) in other receivable	38	(24)
Decrease in prepaid expenses	30	190
Increase (decrease) in accounts payable and accrued liabilities	(195)	196
Decrease in government remittances payable	-	(1)
	4,316	(17,466)
Investing		
Purchase of investments	(11,264)	-
Proceeds on disposal of investments	8,269	14,452
Purchase of capital assets	(151)	-
	(3,146)	14,452
Net cash and cash equivalent inflow (outflow)	1,170	(3,014)
Cash and cash equivalents, beginning of year	25,645	28,659
Cash and cash equivalents, end of year	26,815	25,645

Additional information regarding cash flow can be found in Note 9.

See accompanying notes to financial statements

Genome Canada

Notes to the financial statements

March 31, 2015

(in thousands of dollars)

1. Description of the business

Genome Canada (the "Corporation") was incorporated on February 8, 2000 under the Canada Corporations Act and continued on December 11, 2012. The Corporation is a not-for-profit organization and has the following objectives:

- (a) The development and establishment of a co-ordinated strategy for genomics research to enable Canada to become a world leader in areas such as health, agriculture, environment, forestry and fisheries;
- (b) The provision of leading-edge technology to researchers in all genomics-related fields through regional Genome Centres across Canada, of which there are currently six, one each in British Columbia, Alberta, the Prairies, Ontario, Quebec and the Atlantic;
- (c) The support of large-scale projects of strategic importance to Canada by bringing together industry, government, universities, research hospitals and the public;
- (d) The assumption of leadership in the area of ethical, environmental, economic, legal, social and other issues related to genomics research, and the communication of the relative risks, rewards and successes of genomics to the Canadian public; and
- (e) The encouragement of investment by others in the field of genomics research.

2. Significant accounting policies

The financial statements have been prepared in accordance with Canadian accounting standards for not-for-profit organizations and include the following significant accounting policies:

Revenue recognition

The Corporation follows the deferral method of accounting for contributions.

Externally restricted contributions and related investment income are recognized as revenue in the year in which the underlying expenses are incurred. A receivable is recognized if the amount to be received can be reasonably estimated and collection is reasonably assured.

Externally restricted contributions for purchase of capital assets are deferred and amortized to revenues on a declining-balance basis at a rate corresponding to the amortization rate for the related capital assets.

Cash and cash equivalents

Cash and cash equivalents consist of cash as well as highly liquid short-term investments. The Corporation considers highly liquid short-term investments as those having a maturity of less than three months from the date of acquisition. Cash and cash equivalents are recorded at fair value.

Receivables

Interest receivable and other receivables are recorded at amortized cost.

Investments

Investments are recorded at fair value. Fair value is determined at quoted market prices. Sales and purchases of investments are recorded at the settlement date. Transaction costs related to the acquisition of investments are expensed.

Genome Canada

Notes to the financial statements

March 31, 2015

(in thousands of dollars)

2. Significant accounting policies (continued)

Capital assets

Capital assets are stated at their net book value. Amortization is provided for using the declining-balance method at the following annual rates:

Furniture and fixtures and office equipment	20%
Computers and software	50%
Telecommunication equipment	30%
Leasehold improvements	Term of lease

Accounts payable and accrued liabilities

Accounts payable and accrued liabilities are recorded at amortized cost.

Pension plan

The Corporation maintains, for the benefit of almost all of its employees, a defined contribution pension plan. The cost of the plan is recorded in the statement of operations as it is incurred. The charge for the year totals \$204 (2014 - \$207).

Use of estimates

The preparation of financial statements in conformity with Canadian accounting standards for not-for-profit organizations requires the use of estimates and assumptions that affect the reported amounts of assets and liabilities, disclosures of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting periods. Accordingly, actual results could differ from these estimates. The most significant estimates used in the preparation of the financial statements include the fair value of investments, the amount of certain accrued liabilities and the estimated useful lives of capital assets. These estimates are reviewed annually and as adjustments become necessary, they are recorded in the financial statements in the year in which they become known.

3. Cash and cash equivalents

	2015	2014
	\$	\$
Cash	547	468
Short-term investments	26,268	25,177
	26,815	25,645

4. Investments

	2015		2014	
	Fair value	Cost	Fair value	Cost
	\$	\$	\$	\$
Provincial government bonds	2,999	2,995	-	-

Provincial government bonds mature in April 2015, and provide an interest yield of 0.9%.

Notes to the financial statements

March 31, 2015

(in thousands of dollars)

5. Capital assets

			2015	2014
	Cost	Accumulated amortization	Net book value	Net book value
	\$	\$	\$	\$
Furniture and fixtures	180	164	16	20
Computer and software	178	176	2	4
Telecommunications equipment	32	31	1	1
Leasehold improvements	151	11	140	-
	541	382	159	25

Cost and accumulated amortization at March 31, 2014 amounted to \$390 and \$365, respectively.

6. Deferred contributions

The Corporation receives grants from the Government of Canada to be held, invested, administered and disbursed in accordance with the related funding agreement between Genome Canada and the Government of Canada.

The Corporation currently operates under four active funding agreements with Industry Canada. The terms and conditions of these agreements call for payments to be made to the Corporation annually, subject to the appropriation by Parliament, at the beginning of each fiscal year, based on the estimated cash requirements for the coming year. During the year ended March 31, 2015, the Corporation received \$200 under the agreement dated March 31, 2008, \$8,800 under the agreement dated March 31, 2010, \$15,500 under the agreement dated January 3, 2012, \$22,500 under the agreement dated January 29, 2013 and \$22,800 under the agreement dated March 10, 2014. The changes in the deferred contributions balance for the year are as follows:

	2015	2014
	\$	\$
Balance, beginning of year	25,183	42,974
Add: grants received	69,800	56,600
Add: investment income	411	565
Less: amounts amortized to revenue	(65,786)	(74,956)
Less: amounts invested in capital assets	(151)	-
Balance, end of year	29,457	25,183

7. Deferred contributions related to capital assets

Deferred contributions related to capital assets represent restricted contributions with which capital assets were originally purchased. The changes in the deferred contributions balance for the year are as follows:

	2015	2014
	\$	\$
Balance, beginning of year	25	35
Add: acquisition of capital assets	151	-
Less: amounts amortized to revenue	(17)	(10)
Balance, end of year	159	25

Genome Canada

Notes to the financial statements

March 31, 2015

(in thousands of dollars)

8. Capital management

The Corporation defines capital as its deferred contributions.

The Corporation's objectives in managing capital are to safeguard its ability to continue as a going concern and pursue its strategy of promoting genomics research by funding eligible projects that meet the mandate and criteria of its funder, the Government of Canada, and provide benefits to other stakeholders. Management continually monitors the impact of changes in economic conditions on its investment portfolio and its funding commitments. There were no changes to the Corporation's approach to capital management during the year.

9. Supplemental cash flow information

	2015	2014
	\$	\$
Loss on disposal of investments	(6)	(387)
Amount transferred to capital assets	(151)	-
Fair value adjustment	(4)	285
	(161)	(102)

10. Commitments

Committed funding

The Corporation is committed to finance approved research projects, science and technology platforms and Genome Centre operations in accordance with established agreements. As at March 31, 2015, the payments committed are approximately \$34,093 in 2016 and \$33,980 for other future years.

Consulting

The Corporation has entered into a consulting agreement expiring in the 2017 fiscal year. The payments committed amount to \$64.

Operating leases

The Corporation leases its premises and equipment under long-term operating leases, which expire at various dates between 2015 and 2019. The minimum aggregate lease payments are approximately as follows:

	\$
2016	147
2017	145
2018	144
2019	24

11. Contingencies

In the normal course of business, the Corporation has entered into a lease agreement for premises. It is common in such commercial lease transactions for the Corporation as the lessee, to agree to indemnify the lessor for liabilities that may arise from the use of the leased assets. The maximum amount potentially payable under the foregoing indemnities cannot be reasonably estimated. The Corporation has liability insurance that relates to the indemnifications described above.

Genome Canada

Notes to the financial statements

March 31, 2015

(in thousands of dollars)

12. Fair value of financial instruments

The carrying value of interest receivable, other receivables, and accounts payable and accrued liabilities approximates their fair value because of the relatively short period to maturity of the instruments.

The fair value of investments is disclosed in Note 4 to the financial statements.

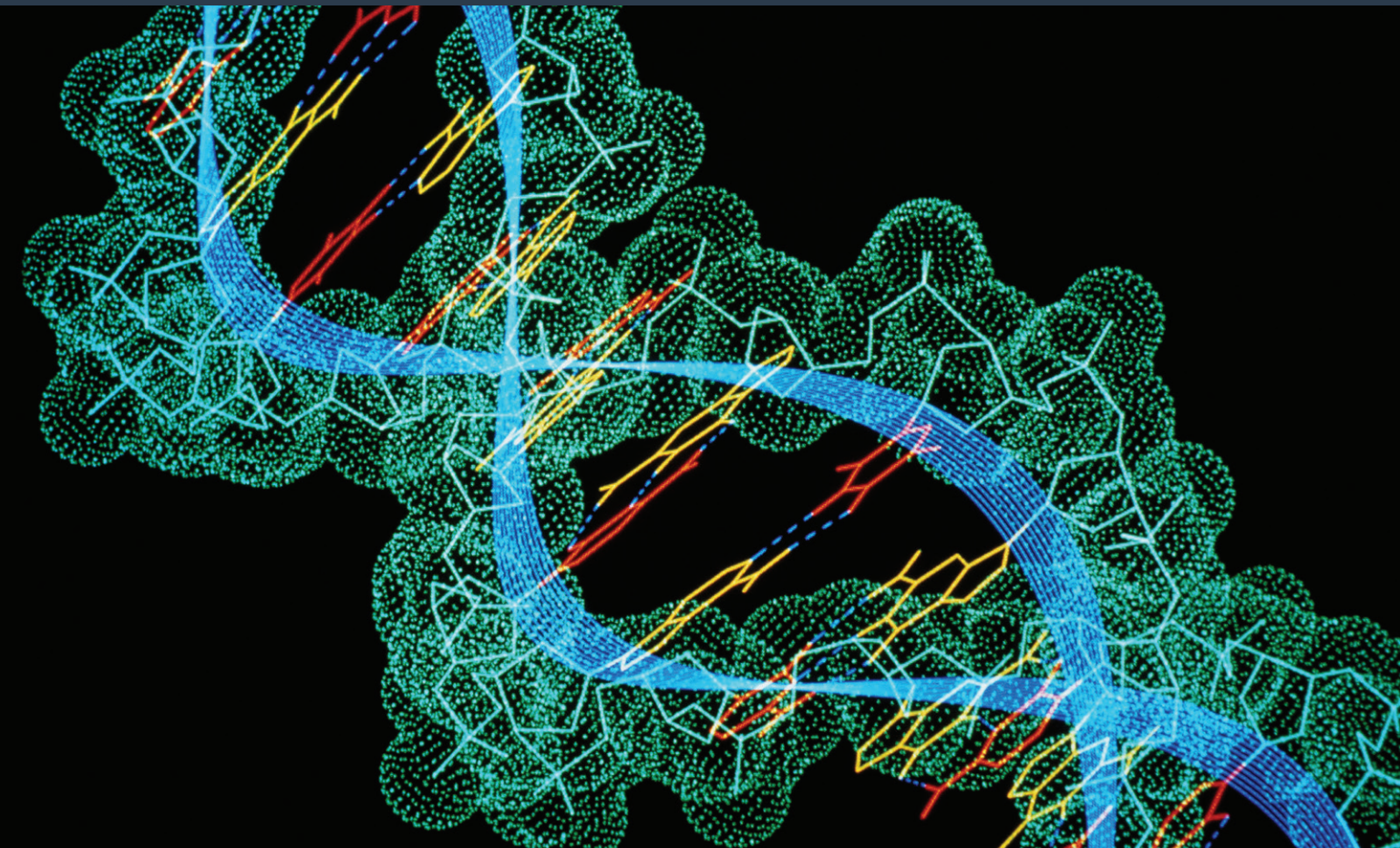
The Corporation is not subject to significant currency risk arising from its financial instruments. The Corporation is exposed to credit and interest rate risk with respect to its interest-bearing investments. The Corporation invests in government bonds to reduce the credit risk to an acceptable level.



We thank the
Government of Canada
for its continued support.



GenomeCanada





GenomeCanada

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