



GenomeCanada

GLOBAL CHALLENGES • GENOMIC SOLUTIONS

2015
ANNUAL
REPORT
2016

GENOMIC INNOVATION

across Canada,
across sectors

TABLE OF CONTENTS

FEATURE STORIES



14 Homegrown Innovation



10 Sharing and Caring



16 Window of Opportunity



18 Tomorrow's Trees



8 Deep Sea Solutions

5 Message from the Chair

6 Message from the President and CEO

7 Impact Stories

20 The Year in Review

26 Pursuing Our Objectives

34 Active Projects Funded

42 Genome Centre Funding

43 Governance

44 Board, Management and Staff

46 Management Discussion

47 Financial Highlights

49 Financial Outlook

50 Auditor's Report

62 Acknowledgement



12 Fish Finders



GenomeCanada

Genome Canada is a not-for-profit organization that acts as a catalyst for developing and applying genomics and genomic-based technologies, and in so doing, creates economic and social benefits for Canadians.

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A SCIENCE FOR SUSTAINABLE ECONOMIC GROWTH



JEAN-MARC GARISE

Lorne Hepworth, Chair, Genome Canada

AS MY TERM AS CHAIR of Genome Canada comes to a close, I continue to marvel at the power and promise of genomics and the amazing achievements of Canada's genomics research community.

In 15 years, genomics – which deals with the analysis and functioning of entire DNA sequences in humans and other organisms – has matured rapidly. Genome sequencing costs have declined tremendously, while the speed of the process has accelerated. At the same time, sustained federal investments in the field since 2000 have propelled Canada into the ranks of global leaders.

While we are not the biggest country in this highly competitive area, Genome Canada, as the leader of Canada's genomics enterprise, has taken full advantage of our nation's unique features, which give us a competitive advantage.

One of these features is our strong culture of collaboration. Provinces, businesses, not-for-profit and international organizations want to work with us and are willing to put skin in the game through substantial co-funding of our research, a core component of our business model. Collaboration is a hallmark of our research teams themselves, which despite our vast geography work in pan-Canadian and international groups that bring the best resources together to tackle highly complex questions.

Another defining feature is our multi-sectoral approach. Canada boasts unique social and resource-based assets that lend themselves to genomic applications. Our ethnically-diverse population and universal health-care system make us amenable to personalized health approaches. Our rich natural resources, which can be sustainably

“The translation of genomic science into use in society is a key part of our plan going forward and is how we intend to contribute to Canada's innovation agenda.”

developed and enhanced through genomics, provide unique opportunities for research, innovation and economic growth.

Genome Canada's suite of programs have proven effective in fuelling the pipeline of discovery through a balanced portfolio of investment in large-scale science, leading-edge technologies and translation of science knowledge into applications across key sectors of importance, including health, agriculture and agri-food, forestry, fisheries and aquaculture, the environment, energy and mining.

The translation of genomic science into use in society is a key part of our plan going forward and is how we intend to contribute to Canada's innovation agenda. We're working with a growing number of partners from all the aforementioned sectors to integrate genomics – an enabling technology – into diverse industries. Our investments will save lives, make our health-care system more efficient and cost-effective, create jobs and economic growth, boost exports and protect our cherished environment.

Last December, Genome Canada marked its 15-year anniversary. We've come a long way since 2000. It will be truly remarkable to watch where genomics takes us in the coming years. With continued commitment to this science, genomics will be a major tool for Canadian growth and prosperity.

On a closing note, I wish to warmly welcome Marc LePage as new President and CEO. His passion for genomics and dedication to building Canada's leadership in the field will undoubtedly take Genome Canada onward and upward!

Last but not least, my sincere thanks go to my fellow Board members for their support and commitment to genomic excellence in Canada. I wish to also thank the staff of Genome Canada for the energy, enthusiasm and dedication that they bring to the organization. And I am grateful to all who make up Canada's genomics enterprise, including the regional Genome Centres, our stellar research community, and our multiple partners, who have helped distinguish Canada as a leading nation in genomics. I wish you tremendous success for the future.



Lorne Hepworth,
Chair, Board of Directors
Genome Canada

ADVANCING CANADIAN INNOVATION IN GENOMICS

I AM DELIGHTED TO PRESENT my first annual report as President and CEO of Genome Canada, a role I assumed in January 2016. As you will see in the pages of this report, a tremendous amount of work has been accomplished over the past fiscal year by our Board and staff, and by our research community and partners in Canada's genomics enterprise.



JEAN-MARC CARISSE

Marc LePage, President and CEO, Genome Canada

“Genomics is entering prime time.”

Having previously worked at one of Canada's six regional Genome Centres, I can attest to the critical importance of federal leadership in genomics. A substantial federal investment, through a strategic body such as Genome Canada, is the catalyst required to mobilize multiple players, from all regions and diverse sectors, to advance Canadian innovation in this cutting-edge field of science and technology.

Federal leadership was apparent in Budget 2016, which committed \$237.2 million in multiyear funding to Genome Canada to continue to support leading genomics researchers and promising scientific breakthroughs.

This new funding empowers us to launch new programs designed to address pressing global challenges – improving health care, mitigating the effects of climate change and enhancing food security worldwide, to name a few. It will allow us to put genomic tools and approaches into the hands of Canadian public- and private-sector genomic users and help them develop innovative solutions to societal and commercial problems.

We have presented in this report just a few illustrations of the fantastic work taking place across Canada in genomics, which is spurring innovation. A project underway in Western Canada will soon deliver fully renewable biocomposite materials made from flax, with potential to revolutionize the automotive sector. Another project is combining traditional Inuit and scientific knowledge to seek a deeper understanding of Arctic marine species, with an eye toward food security and sustainable economic development in Canada's North. And another is using microbial genomics to de-risk offshore oil and gas exploration in Nova Scotia.

Five to ten years ago, these kinds of advances would have been inconceivable. But genomics is entering prime time and these examples are just the tip of the iceberg.

The federal government has embarked on an assertive agenda to ensure Canada stands tall in the global economy. On behalf of Genome Canada, I wish to sincerely thank the Government of Canada for its support. We look forward to putting Canada at the forefront of genomics-based innovation for the benefit of all Canadians.

Marc LePage,
President and Chief Executive Officer
Genome Canada

IMPACT STORIES



INNOVATION is at the heart of all we do at Genome Canada. The science, technology and translation of knowledge we support leads to new tools, products, processes, policies and ideas that contribute to Canada's growth, making it much stronger and better. What follows is a sampling of initiatives, from across sectors and regions, which illustrate the diverse range of innovations stemming from Genome Canada-funded research.



deep sea solutions

Looking for oil beneath the ocean is a needle-in-a-haystack challenge, but bacteria that consume hydrocarbons can help identify promising places to drill

THE SCOTIAN SLOPE, a 160,000-square-kilometre swath of seabed south of Nova Scotia, is an attractive but challenging area for oil exploration. The energy industry has invested \$37 billion in offshore development in Atlantic Canada over the past two decades, but little is known about what lies beneath the Scotian Slope, which makes the search for drilling locations a long and expensive process.

Thanks to a partnership between the Nova Scotia Department of Energy and the University of Calgary's Geomicrobiology Group, however, exploration companies could be steered in the right direction by some tiny helpers. A teaspoon of sediment from the



Dr. Casey Hubert

“In risk assessment decisions about whether to drill for oil or not, our premise is that having more information is better. Genomics can add a new layer.”

— Dr. Casey Hubert, microbiologist, University of Calgary

Genome Canada is investing \$1.6 million in Microbial Genomics for De-risking Offshore Oil and Gas Exploration in Nova Scotia – a \$4.9 million project funded in Round 5 of the Genomic Applications Partnership Program. Through a partnership with Mitacs, several GAPP projects, including this one, involve internship opportunities for graduate students and post-doctoral fellows, which will prepare Canada’s next entrepreneurs through hands-on experience.

ocean floor contains about a billion bacteria. Some of these bacteria consume hydrocarbons; they can indicate the presence of sub-surface oil and help identify promising places to drill test wells.

“We’re using genomics to do a ‘census’ of the microorganisms in seabed sediment samples,” says Geomicrobiology Group leader Dr. Casey Hubert. “The DNA tells us the composition of that population. A high proportion of specialized hydrocarbon-degrading bacteria could indicate an oil reservoir below. If the genomic, geophysical, chemical and seismic data all line up, it might be a hot spot for petroleum.”

Field work for this project began last summer aboard the *CCGS Hudson*. Core samples were taken at water depths reaching 2,500 metres. Some were analyzed in a lab on the *Hudson*; others were sent to the University of Calgary. One of the goals of this summer’s field season, says Dr. Hubert, is to attempt more of the genomics while at sea, so the ship can quickly

return to a specific location if results are interesting.

In addition to looking for aerobic and anaerobic bacteria (which need and don’t need oxygen to grow, respectively), Hubert is also interested in thermophilic bacteria, believed to flow upwards with hydrocarbons toward the ocean floor. These thermophiles prefer high temperatures and are dormant until sediment samples are heated, indicating the potential for warm oil reservoirs far below the seabed. The team hopes that layering together information on all three types of bacteria will offer a more comprehensive picture.

“This is cutting-edge research that requires a lot of integration,” says Adam MacDonald, a petroleum geophysicist with the Nova Scotia Department of Energy. “I’m optimistic it will help. Everybody is trying to zero in on the target but we have an enormous geographical area, so we can use genomics to reduce the risk.”





sharing and caring

Big Data is a powerful tool for health researchers, but ethical, legal and technical questions must be considered before genomic information is shared

ADVANCES IN DNA sequencing have allowed researchers to accumulate vast amounts of human genomic data. In the right hands, this “Big Data” has many potential health applications, from increasing our knowledge of rare diseases and supporting the development of new cancer therapies to helping clinicians care for patients. But sharing genomic information across international and provincial borders — and even between local institutions — can be extremely complex. There are technical challenges to overcome, because datasets are so diverse, and a range of ethical and legal questions to consider around regulation, privacy and consent.

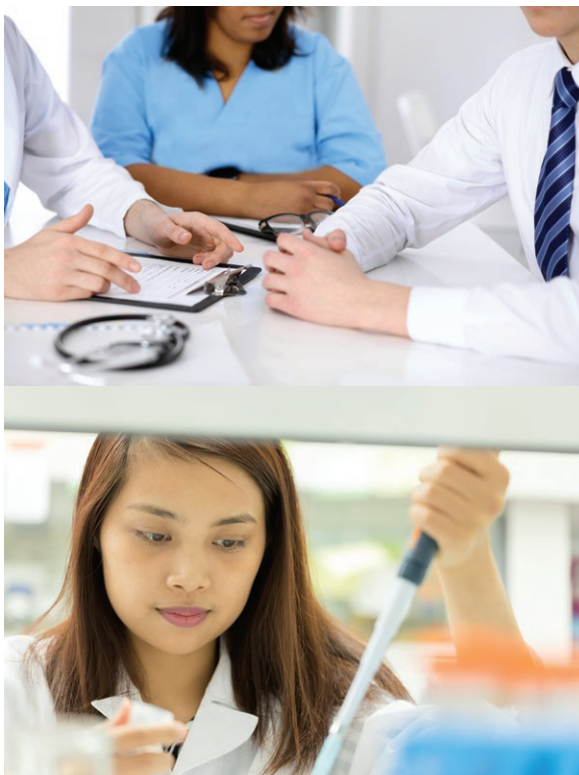
“People are rightfully cautious about data sharing,” says lawyer Prof. Bartha Knoppers, chair of the McGill University-based Public Population Project

in Genomics and Society (P3G). “But we need to share in order to have a sustainable universal health-care system.”

Prof. Knoppers is one of the principal investigators leading the three-year Canadian International Data Sharing Initiative (Can-SHARE), which will create policies and tools that facilitate responsible genomic collaboration across this country and beyond.

In addition to supporting a regulatory and ethics working group of the Global Alliance for Genomics and Health, Can-SHARE involves Canadian-led rare disease demonstration projects. One researcher might do a study with a few thousand participants, but they will gain more insight into the genetic variation they’re exploring by aggregating and analyzing very large datasets. “Strong statistical power is

Can-SHARE launched in 2015 with \$3.3 million in funding from multiple sources, including Genome Canada, CIHR, G enome Qu ebec, Genome British Columbia and the Ontario Ministry of Research and Innovation. It aims to advance the objectives of the Global Alliance for Genomics and Health, an international coalition formed to enable the sharing of genomic and clinical data.



“With Can-SHARE, we’re further developing Canadian investment in science and policy research, and at the same time providing international leadership.”

— lawyer and ethicist Prof. Bartha Knoppers



often needed to demonstrate that a certain trait has a health impact,” says Anne Marie Tass e, P3G’s Executive Director. “Data sharing allows researchers to obtain better quality results more quickly.”

Can-SHARE will also incorporate pilot projects that create harmonized approaches to data sharing, including codes of conduct for data sharing and governance. “When we work at the global level, we need to make sure we have common policies among all the partners,” says Prof. Knoppers. “Can-SHARE will help us build these global policies and also transform them into practical tools.”

If one type of research ethics review is deemed to be the most effective, for example, multiple parties involved in a project could mutually recognize the same best practices, and devote more of their time and resources to research instead of inconsistent ethics approvals. “Once research knowledge is obtained,” says Tass e, “the work can move forward and the next step could very well be the development of a better or new therapeutic approach.”



fish finders

Inuit and their research partners seek a deeper understanding of Arctic marine species, with an eye toward food security and sustainable economic development

FOR THE PEOPLE OF GJOA HAVEN, a hamlet of about 1,300 on the southeast coast of Nunavut's King William Island, Arctic char are the foundation of a healthy diet. Harvested in lakes and rivers as well as the sea, the fish are plentiful and rich in vitamin D, important considerations in a remote northern region where sunlight is limited for half the year and most fresh food has to be flown in from hundreds of kilometres away.

Fisherman James Qitsualik, former chair of the Gjoa Haven Hunters' & Trappers' Organization, knows where to catch char, which he shares with his large extended family. But as a warming climate opens up the waters of the Northwest Passage, raising the prospect of more commercial fishing, Qitsualik is readily participating in a research project to create a genetic profile of char and species such as Arctic cod and Northern shrimp to ensure their har-

vest remains sustainable for generations to come.

"We're just trying to help make healthy food accessible to more people," says Qitsualik, explaining that char caught near Gjoa Haven could be sent to a processing plant in Cambridge Bay, Nunavut, which would





Towards a Sustainable Fishery for Nunavummiut, a \$5.6 million project, is one of 11 large-scale applied research projects funded in 2015 as part of Genome Canada's *Genomics and Feeding the Future* program.

provide some income for locals. "In the spring and summer, practically everybody here fishes."

Dr. Virginia Walker, a molecular geneticist at Queen's University and one of the leaders of the Towards a Sustainable Fishery for Nunavummiut project, says this research would not be possible without combining traditional Inuit and scientific knowledge. She doesn't know how many distinct genotypes of char and other fish species live in a study area the size of Great Britain, but elders will recommend where to do fieldwork based on their familiarity with fish habitats. Char will be caught and dissected on the land, thanks to a snowmobile-pulled mobile lab, or frozen and sent to southern universities for DNA sequencing.

"Genetic analysis will allow us to identify different populations of char and help us understand their demographics and migration patterns," says Dr. Walker. "You need to be very precise when you come up with a fisheries management plan."

The project could also help Canada stake a stronger claim to the contested waters of the Northwest Passage. Ultimately, however, it's about food security. "And it's not really our project," says Dr. Walker. "It belongs to the people of Nunavut. We're just helping with the science."

“ We need to know more about the fish species in the Arctic. This is a made-in-Nunavut solution.”

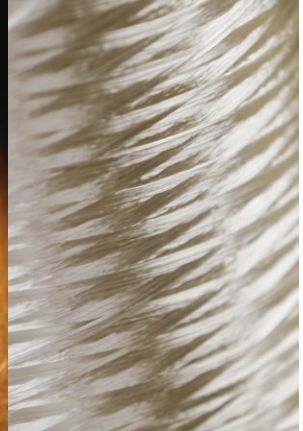
— Dr. Virginia Walker, biology professor





homegrown

Biocomposite materials made with cross-bred flax fibre could give the automotive and other industries lighter, stronger and biodegradable components



innovation

THE GO-4 AND GO-4 EV, 52-inch-wide gas and electric urban utility vehicles made by Winnipeg's Westward Industries are ideal for parking enforcement agencies, police departments, airports and myriad other uses. And they could become even more efficient thanks to an innovative project to replace the aluminum and steel compartment where drivers sit with a "tub" made from lighter, stronger, soundproof and biodegradable biocomposite materials.

"It's a win-win-win situation," says Stefano Franz, the President of Westward Industries. "This will speed up the manufacturing process and help the environment. The metal parts can be recycled, but that takes a lot of energy. And the weight reduction improves fuel efficiency."

Canada is the world leader in flax production, but the plant's stem produces a very strong fibre that there is little demand for after the oil seeds are extracted. Five years ago, as part of a project supported by Genome Canada, University of Alberta researchers deciphered the genetic code for flax. That opened a door to the Fibre Composites and Biomatrix Genomics (FiCoGEN) project, which sees flax and other biofibres combined with a natural binding resin to make biocomposites for users such as Westward Industries, which could produce a prototype of its new vehicle by autumn 2016.

The resin comes from the lab of Dr. David Levin, a professor in the Department of Biosystems Engineering at the University of Manitoba and FiCoGEN's academic leader. Dr. Levin and his group have used a novel bacterium that grows on "waste" byproducts from biodiesel production to make a biodegradable polymer. "If we can use waste materials to produce these polymers," he says, "then it closes the loop and makes things more efficient and better for the planet."

The project has been shepherded from the start by the Winnipeg-based Composites Innovation Centre (CIC), a not-for-profit that supports biocomposite R&D and commercialization. Biocomposites made with fibre from Canadian-grown flax and hemp — which need minimal herbicides, pesticides and irrigation — could replace fibreglass in the automotive, aerospace and marine transportation industries, says CIC President and CEO Sean McKay. Combined with cement, the fibre could also be used as a building material.

"There are more than 500 varieties of flax in the global core collection," says McKay. "Genomics is helping us understand different varieties so that we can select and cross-breed those with the most suitable properties to produce higher-quality industrial fibre while still producing quality oil seed."

FiCoGEN received \$3.3 million in funding (\$1.1 million from Genome Canada) through the Genomic Applications Partnership Program in fiscal year 2015-16. The program partners academic researchers with "users" of genomics (e.g. industry, provincial governments, non-profits or other organizations) to develop innovations that are expected to have considerable economic and social impacts within the near term.



“We’ve been working at bringing natural fibres into biocomposites for the past 10 years. Genomics research has helped us take this big step.”

— Sean McKay, President and CEO, Composites Innovation Centre

window of opportunity



A metabolomics* breakthrough creates a fast, accurate and non-invasive way to screen for predisposition to an array of diseases and medical conditions



NUCLEAR MAGNETIC RESONANCE (NMR) spectrometry can be used to determine the molecular composition of biofluids such as blood or urine, but identifying the type and concentration of specific metabolites is a time-consuming process with results dependent on consistent human interpretation. This limits the platform's efficacy as an early-stage diagnostic tool for a wide spectrum of diseases.

Machine learning researcher Siamak Ravanbakhsh had never considered this problem when he started working toward a master's degree at the University of Alberta. "Wouldn't it be great if you could take some blood, push a button and see what's in there?" his advisor, computer scientist Russell Greiner, asked one day. Ravanbakhsh got to work.

*The study of the set of metabolites present within an organism, cell or tissue.

“Genes tell you what might happen someday. The chemical fingerprints in biofluids like blood tell you what’s happening now.”

— Dr. David Wishart, leader of the Metabolomics Innovation Centre

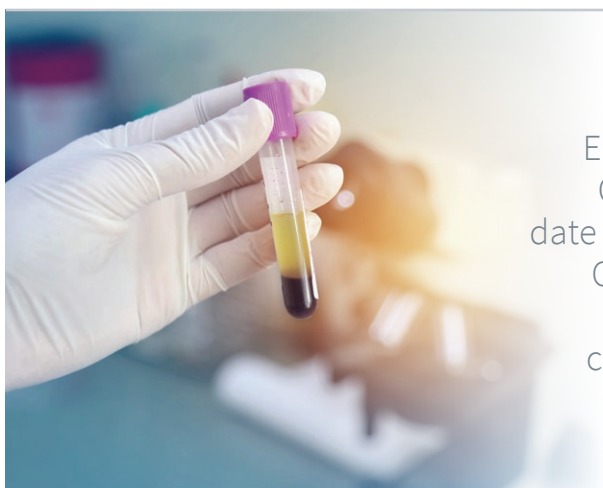
The ensuing breakthrough — a system called Bayesil that can quickly, accurately and automatically produce a metabolic profile from a small biofluid sample — is a big step toward the ability to predict the eventual onset of a number of diseases and medical conditions. Cost-effective and non-invasive, this technology could create myriad new applications for the science of metabolomics.

“We now have a toolbox to effectively analyze and interpret a complex set of compounds,” says Dr. Ravanbakhsh, who earned his master’s and PhD at the U of A and is currently a postdoctoral fellow at Carnegie Mellon University in Pittsburgh. “It’s not something for the future — it’s happening.”

Dr. David Wishart, one of Ravanbakhsh’s PhD advisors and leader of the Metabolomics Innovation Centre in Edmonton, says the research that led to this breakthrough started around 2000 as part of a broader effort to make metabolomics more mainstream. He uses an analogy to explain the significance of the advance: “We’ve been looking at the world through a keyhole, and now we’re looking through a picture window.”

By assessing the concentration of 50 to 60 “metabolic markers” such as glucose and glutamine, this system will be able help doctors ascertain predisposition to diseases such as diabetes and Alzheimer’s, as well as many cancers and even obesity. Early identification can prompt lifestyle or medical interventions that forestall the onset of health problems.

“Most of the exciting stuff in science happens when the fringes of fields like metabolomics and machine learning intersect,” says Dr. Wishart, noting that an Edmonton company has developed a urine test to screen for pre-cancerous colon polyps, and that a kit allowing labs to use the technique at the heart of Bayesil could be on sale by summer 2016. “In these new frontiers, collaborations can be very fruitful.”



Genome Canada has been funding the Edmonton-based Metabolomics Innovation Centre since 2010, for a total investment to date of \$5 million. The Centre is one of Genome Canada’s 10 Genomics Innovation Network Nodes, which ensure Canada’s research community has access to the latest cutting-edge ‘omics* technologies and expertise.

*Genomics and related disciplines such as proteomics, metabolomics and bioinformatics.

tomorrow's trees

Climate change is threatening the health of Canada's forests, but revolutionary genomics research will give foresters a way to push back



THE FORESTRY INDUSTRY contributed more than \$20 billion to Canada's GDP in 2014, and directly and indirectly employed 288,000 people. But despite a long and viable tradition of hewing wood, climate change is causing serious concerns: the health of tree populations, which are adapted to thrive in the past climates of their regions, is suffering, making them more susceptible to insects and disease.

Threats to the ecological, economic and recreational value of forests was the catalyst for the AdapTree project, which launched in 2011. AdapTree is supported by Genome Canada and Genome British Columbia, as well as the provincial governments of B.C. and Alberta. Scientists are using cutting-edge genomics technologies, as well as geospatial analysis and climate modelling, to sequence seedlings and determine which genes help trees adapt to local climate conditions — and which trees should be planted where in the uncertain years ahead.

“Our goal is to introduce new practices on the ground,” says Dr. Sally Aitken, one of the project leaders and Director of the Centre for Forest Conservation Genetics at the University of British Columbia. “We’re trying to match trees to new climates, a moving target.”

Tree genomes are seven times larger than human genomes, which makes this research especially complex. But by analyzing genetic variation in DNA from lodgepole pine and spruce trees from more than 250 populations to understand how they have adapted to heat, cold and drought, Aitken and her colleagues have identified strong candidates for “assisted migration” without sacrificing genetic diversity. They’re now doing final data analyses to confirm their findings before making planting policy recommendations to provincial governments.

Forestry research typically involves planting seedlings from different populations in several field locations, and waiting a decade or two to see the results. Genomics, says Aitken, provides “a much more nuanced picture of the dynamics of tree adaptation much more quickly than traditional approaches.”

AdapTree co-leader Andreas Hamann, who studies landscape genomics at the University of Alberta, an amalgamation of population genetics and landscape ecology, brings a spatial perspective. His heat map models, which look at the “velocity of climate change,” will help planters keep up with global warming over the next few decades. “This is substantially better than managing our forests as if they were in a 1970s climate,” says Hamann, “which is basically what we’re doing now.”



“ We have an opportunity to change the genetic composition of what we plant to lead to more resilient forests.”

— Dr. Sally Aitken, forest geneticist, University of British Columbia



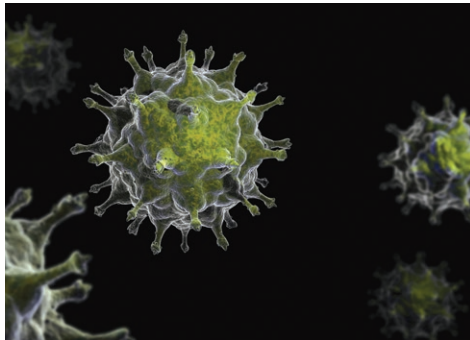
Genome Canada invested \$2.3 million in AdapTree, a \$4.7 million project funded as part of the 2010 Large-Scale Applied Research Project Competition – Forestry and Environment. The project is ensuring that the right trees get planted in the right climatic areas, improving the long-term health of forests and generating economic benefits valued at hundreds of millions of dollars every year.



THE YEAR IN REVIEW

APRIL 13, 2015

Genome Canada and partners announce a new research project aiming to improve monitoring of avian influenza and predict and prevent future outbreaks.



APRIL 21, 2015

Canada's 5th "DNA Day" celebrates the historic 1953 discovery of DNA's double helix structure.

APRIL 20, 2015



Genome BC and Genome Canada announce a new research project to improve strategies for monitoring the impact of the Mount Polley Mine tailings dam breach on the ecosystem and to provide recommendations for environmental remediation.

JUNE 4, 2015

Genome Canada launches the 2015 Large-Scale Applied Research Project Competition *Natural Resources and the Environment: Sector Challenges – Genomic Solutions*. The scope of the funding opportunity includes genomics research related to energy, mining, forestry, water stewardship, wildlife management and conservation, and bioproducts that help conserve natural resources and protect the environment.



JUNE 5, 2015

Round 3 Genomic Applications Partnership Program projects are announced. The projects aim to: deliver more targeted personalized cancer treatment; enhance soybean oil for commercial use; improve outcomes for lung transplant patients; and, grow more resilient and higher-quality conifer trees.



JUNE 11, 2015

Genome Canada launches the 2015 Disruptive Innovation in Genomics Competition. The funding opportunity will support projects that deliver innovations in the field of genomics that are truly transformative and could displace an existing technology, disrupt an existing market or create a new market.

JUNE 26, 2015

Genome Canada and the Social Sciences and Humanities Research Council of Canada sign a joint initiative agreement to jointly support social sciences and humanities research and related activities pertaining to genomics, with one of the first initiatives focusing on the societal implications of disruptive innovation in genomics.

JULY 21, 2015

The Government of Canada announces the results of Genome Canada's 2014 Large-Scale Applied Research Project Competition *Genomics and Feeding the Future*, a program conducted in partnership with the Western Grains Research Foundation. A total of \$93 million is invested in 11 projects that address challenges and opportunities for Canadian agriculture, fisheries and aquaculture. (see Fish Finders on p.12 for an illustration of one project funded through this Competition.)



Dr. Kirstin Bett co-leads a University of Saskatchewan-based project applying genomics to breed better lentil varieties that will excel under Canadian growing conditions.

AUGUST 13, 2015

Genome Canada's President and CEO since October 2010, Dr. Pierre Meulien, steps down from his position to pursue a new opportunity as Executive Director of the Brussels-based Innovative Medicines Initiative, the world's largest public-private partnership initiative in the life sciences. Executive Vice-President Dr. Cindy Bell assumes the role of Interim President and CEO of Genome Canada.

OCTOBER 29, 2015



Genome Canada, in partnership with the Canadian Institutes of Health Research, launches the 2015 Bioinformatics and Computational Biology Competition. The funding opportunity aims to support the development of next generation tools and methodologies that will be required to reap the benefits of the influx of large amounts of data produced by modern genomics technologies.

THE YEAR IN REVIEW

DECEMBER 9, 2015

Genome Canada celebrates 15 years of research and innovation at a reception at the Château Laurier in Ottawa.



JEAN-MARC CARISSE

DECEMBER 15, 2015

Genome Canada and the Canadian Institutes of Health Research announce funding for Can-SHARE – a pan-Canadian program that will enable innovation in the use of genomic data for health care to benefit patients in Canada and worldwide.



JEAN-MARC CARRISSE

Mr. Marc LePage, President and CEO

JANUARY 4, 2016

Mr. Marc LePage joins Genome Canada as its new President and CEO. Mr. LePage was one of the pioneers behind the founding of Genome Canada in 2000, and comes to Genome Canada after serving as President and CEO of Génome Québec since 2011.

JANUARY 11, 2016

An international consortium of scientists, co-led by the University of Saskatchewan, announces that it has been able to crack the code for understanding the sequence of about 90 per cent of the highly complex bread wheat genome, the most widely grown cereal in the world.



JANUARY 13, 2016

New research co-led by SickKids and the BC Cancer Agency offers a simple explanation as to why new and experimental treatments fail for children with medulloblastoma, the most common cancerous brain tumour in children. The study is published in *Nature*.

FEBRUARY 4, 2016



Dr. Peter Dirks (LEFT) and the Hon. Reza Moridi, Ontario Minister of Research and Innovation

A new Stand Up to Cancer Canada Cancer Stem Cell Dream Team is announced. The Canada-wide team of researchers will use genomics to develop safe and effective brain cancer treatments.

THE YEAR IN REVIEW

FEBRUARY 22, 2016

Genomics on the Hill showcases outstanding genomic research and applications across regions and sectors. The event on Parliament Hill in Ottawa draws more than 200 guests, including politicians from all parties.



GENOMICS ON THE HILL



JEAN-MARC CARISSE



FEBRUARY 23-24, 2016

Genome Canada partners with Genome Alberta, Genome BC and the Canadian Food Inspection Agency to host a forum aimed at steering genomics to address antimicrobial resistance, a growing global concern.

MARCH 10, 2016

Four new projects funded in Rounds 3 and 4 of the Genomic Applications Partnership Program are announced. The projects aim to: enhance commercial use of canola oil and meal; develop and test a vehicle prototype using a novel biocomposite made of flax fibre and binding resin; realize the commercial potential of a novel therapeutic that fights cancer; and develop a new instrument that can rapidly diagnose infections at the point-of-care.

MARCH 17, 2016

A new network connecting 17 Genome Canada-funded projects in an effort to strengthen personalized medicine for Canadians is announced.

MARCH 22, 2016

Federal Budget 2016 invests \$237.2 million in funding for genomics through Genome Canada. The new funding is expected to fuel innovation, job growth and economic and social prosperity for all Canadians.

MARCH 29, 2016

JEC Group announces that Genome Prairie and partners are the recipient of a prestigious 2016 JEC Americas Innovation Award in the Biocomposites category. The international honour stems from a Genome Canada-funded project exploring how genomics can revolutionize the automotive sector (see Homegrown Innovation story, p. 14)

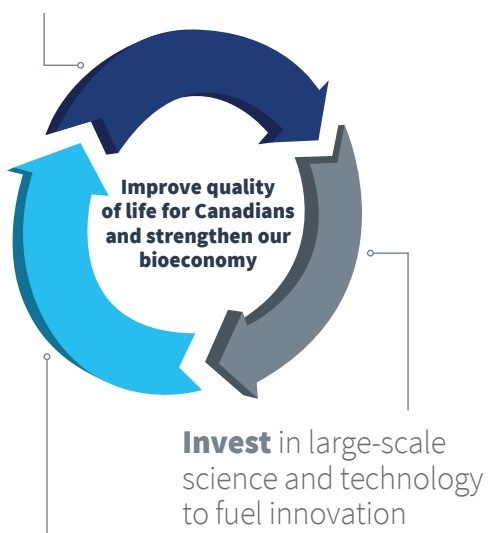


INNOVATION

PURSuing OUR OBJECTIVES

Our Mission

Connect ideas and people across public and private sectors to find new uses and applications for genomics



Translate discoveries into applications to maximize impact across all sectors

Objectives

- Respond to societal needs by generating genomics discoveries and accelerating their translation into applications.
- Attract greater investment in genomics research from a broad range of stakeholders, in particular the private sector.
- Enhance the impact of genomics by transforming knowledge of the ethical, environmental, economic, legal and social challenges and opportunities into sound policies and practices.
- Enhance the recognition of the value of genomics by increasing stakeholder appreciation of genome science, its applications and implications.

GENOME CANADA MADE considerable progress in fulfilling its mission and meeting its objectives during the fiscal year.

Partnerships remain at the heart of our business model. We continue to work with partners to synergize our activities to ensure investments have the greatest positive impacts for Canadians.

We engage partners and stakeholders to consult on new program design and development. For example, the 2014 Large-Scale Applied Research Project Competition (LSARP) *Genomics and Feeding the Future* and the 2015 LSARP *Natural Resources and the Environment: Sector Challenges – Genomics Solutions* were both informed by sector and user needs as identified by a series of sector strategies, ensuring key economic drivers were targeted and that areas with a high potential for translation into practical applications were emphasized.

We have continued to pursue co-funding collaborations with other organizations on initiatives where our innovation goals are aligned. We have been successful in securing co-funding at a higher level than previously. This is a strong indication that stakeholders from multiple sectors recognize the transformative power of genomics and are keen to support innovation through co-investment in research and its translation into use in society. Our co-funding ratio has increased to a ratio of approximately 1:2 (Genome Canada: partner) since 2012, as compared to our traditional co-funding ratio of 1:1 since our inception in 2000. We have seen a significant rise in private sector engagement through programs such as the Genomic Applications Partnership Program (GAPP), Phase II of the Cancer Stem Cell Consortium, and public-private partnership initiatives we support such as the Structural Genomics Consortium (SGC).

Since our inception in 2000, we have evolved our suite of programs to reflect both the rapidly changing state of genomics-based science and the opening up of opportunities across all sectors of the bioeconomy, driven by users of genomics in both the private and public sectors. The knowledge generated through our funding programs supports evidence-based policy-making, strengthens Canada's bioeconomy and improves the quality of life for



CLIMATE-ADAPTED
SEEDLINGS



GOOD
HEALTH




HEALTHY
ENVIRONMENT




BETTER
BREEDING




PLENTIFUL
FISH STOCKS




BETTER MINERAL
EXTRACTION AND
PROCESSING




SAVING
LIVES



GENOMIC DISCOVERY IN WHEAT

Canadians. The numerous projects we funded during the fiscal year, through a number of programs, are detailed in the next section (Active Projects Funded). Further, new programs that we have designed and launched during the fiscal year are highlighted in the previous section (Year in Review).

Innovation is central to our work, and is accelerated through our enhanced focus on translation of scientific knowledge into applications, including commercialization. We have pursued translation activities in large part through GAPP. GAPP was 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 address real-world challenges and opportunities in the field of genomics. Through GAPP, we connect genomic academic researchers with users in private and public sector organizations. Since its launch in 2013, the program has experienced phenomenal success in terms of participation across sectors. More than 20 projects are currently in play with users focusing on applications as diverse as novel therapeutics, greener automobile manufacturing, improved feed for fish, poultry and swine, enhanced cheese quality and personalized diagnostic tools for lung transplantation and other diseases. It is clear that Canadian sectors are primed to integrate genomics to drive innovation, foster sustainable practices and power the growth of their businesses. Further, through a partnership with Mitacs, GAPP projects are training the next generation of entrepreneurs who will know how to advance genomics in Canadian industries of the future.

Another significant translation activity involved the launch of the GE³LS* Network in *Genomics and Personalized Health*. As part of the 2012 LSARP – Genomics and Personalized Health, the GE³LS Network was introduced as a way to cross-fertilize and leverage the efforts of GE³LS research work across the 17 projects. The Network will facilitate the sharing of best practices, improve and prime future research collaboration, accelerate the progress to application of technologies, and maximize the impact of investments in these projects.

We also undertook a number of activities to increase awareness among key target audiences of the value of genomics in society. We hosted two events designed to foster evidence-based public policy and identify timely and socially relevant research priorities: ‘Can Genetically Modified Crops Help the

*GE³LS stands for genomics and its ethical, environmental, economic, legal and social aspects.

Poor?’ and ‘Beating Superbugs: Innovative genomics and policies to tackle AMR.’ We published policy briefs based on both events to present informed policy options to decision makers in government. One policy brief became the basis of an opinion piece published in *the Globe and Mail*.

In addition, through numerous communications, events and sponsorship activities, we increased public and key stakeholder awareness of and appreciation for the benefits of genomics for Canada. For example, our Genomics on the Hill event was a tremendous success. We showcased a dozen research projects spanning multiple sectors and regions, showcasing the science and its concrete applications in many areas of society. The event attracted 73 Members of Parliament, six Ministers, multiple Senators, as well as many political staff and key stakeholders. Furthermore, we significantly enhanced our engagement with the public, politicians, and officials from government, industry and the research community through broader and more frequent social media activity. And we worked with national, regional and specialized media outlets to convey stories about the power and promise of genomics in the realms of personalized medicine, agriculture, the environment, among other areas.

Moving into 2016-17, Genome Canada will begin flowing funding to the 2015 LSARP projects and announce funding decisions for the 2015 Disruptive Innovation in Genomics competition. Two new competitions are being planned including another GAPP round in early 2016-17 and the release of a Call for Applications for a 2017 LSARP competition focused on health. Genome Canada will continue to support leading-edge technologies that enable Canadian genomics research, including support for Genomic Innovation Network (GIN) Nodes. A total of up to \$10 million in funding was set aside for strategic research priorities determined by the Genome Canada Board of Directors in 2014-15. Genome Canada will also continue to foster partnerships, and provide rigorous administrative oversight and/or monitoring of ongoing funded projects and initiatives. We will also be working with the Government of Canada to implement the new funding agreement stemming from Budget 2016. We look forward to working in close collaboration with the federal government to do our part in strengthening Canadian innovation, growth and prosperity.






HEALTHY
FOODS




PEST-RESISTANT
FORESTS




CLEANER
WATER



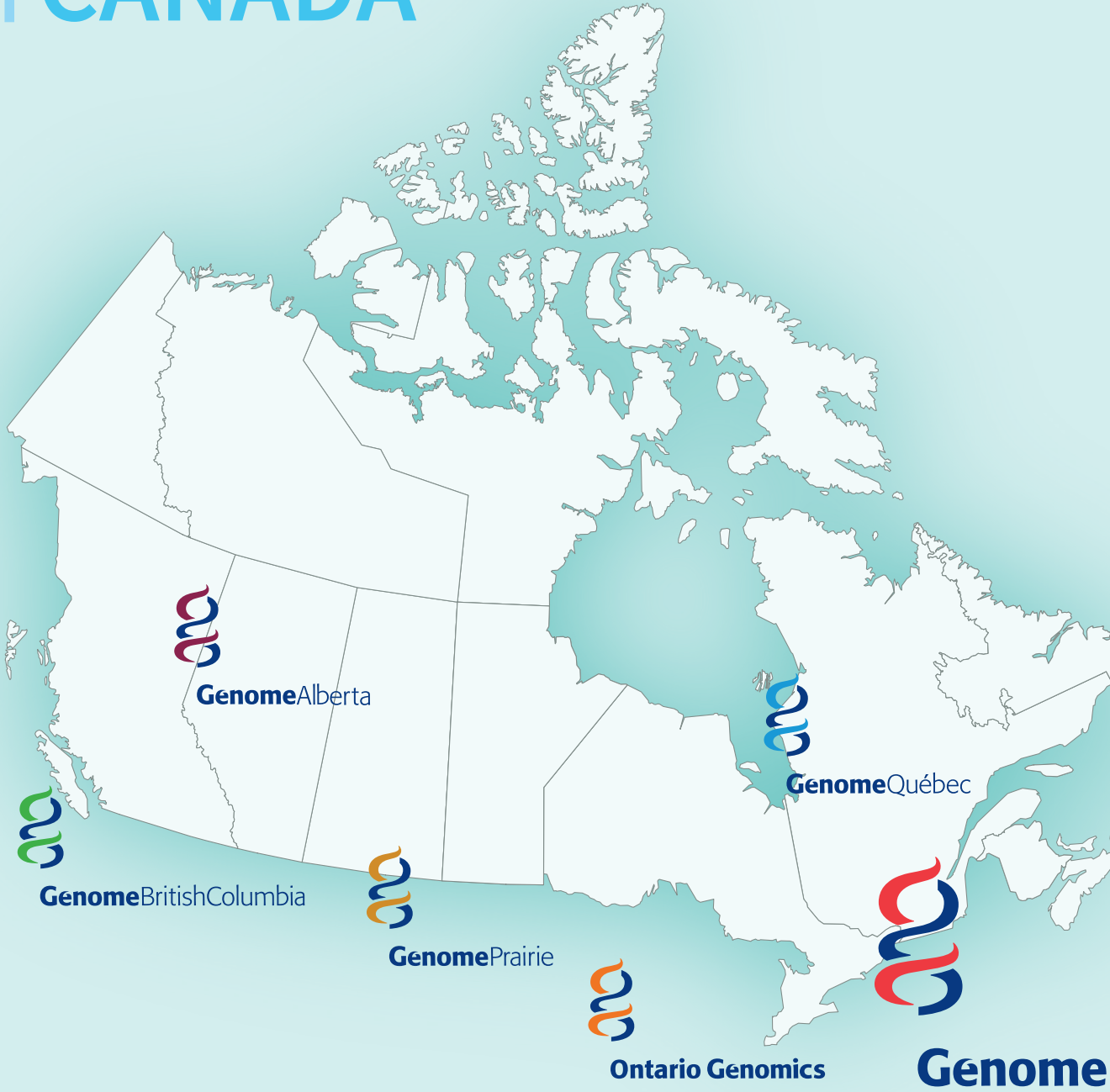

IMPROVE SPECIES
QUALITY AND GROWTH




GREENER
ENERGY

SINCE 2000

GENOMICS ACROSS CANADA



BY THE NUMBERS:

6	GENOME CENTRES
10	TECHNOLOGY PLATFORMS
>240	LARGE-SCALE PROJECTS
>2,000	HIGHLY SKILLED RESEARCH JOBS PER YEAR
33	UNIVERSITIES
7	KEY SECTORS
>\$1.3B	GENOME CANADA
>\$1.7B	INDUSTRY, AND OTHER CO-FUNDING PARTNERS
195	INDUSTRY CO-FUNDERS
> 110	COMPANIES CREATED OR ENHANCED



GenomeAtlantic

Canada

2015-2016

ACTIVE PROJECTS FUNDED

A RIGOROUS COMPETITIVE PROCESS determines which research projects and technology platforms will be funded. Projects are selected through a peer review system that includes an assessment of the scientific merit of the proposal, its potential social and economic benefits for Canada, and a concurrent due diligence review of the proposed management structure, the proposed management structure, budget, and related financial data, including co-funding. Reviewers are chosen for their recognized expertise in the science, technology and/or translation arena, and management of large-scale genomics projects, and are drawn primarily from the international scientific community to avoid conflict of interest. Over the past year, Genome Canada recruited 189 reviewers from 12 countries. Genome Canada's Board of Directors makes the final decision on which applications to fund, based on recommendations received from the international panel of reviewers.

All Genome Canada funded projects are actively monitored by the Genome Centres through different mechanisms depending on the nature of the funding program and the type of project. Typically, Research Oversight Committees are organized by the Genome Centres 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 and technology platforms for which funds flowed in fiscal year 2015-2016. The table shows the total funding, including the required co-funding, as well as the contribution from Genome Canada.



LARGE-SCALE SCIENCE

CENTRE(S)	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
LARGE-SCALE APPLIED RESEARCH PROJECTS					
Genome Alberta	Agriculture	Plastow, Graham Harding, John Kemp, Bob	Application of genomics to improve swine health and welfare	\$12,480,747	\$4,899,110
Genome Alberta	Agriculture	Stothard, Paul Miller, Stephen Moore, Stephen	Whole Genome Selection through Wide Imputation in Beef Cattle	\$8,241,119	\$3,860,665
Genome Prairie	Agriculture	Pozniak, Curtis Hucl, Pierre	CTAG-Canadian Triticum Advancement through Genomics	\$8,506,827	\$4,102,386
Genome Québec	Agriculture	Goodridge, Lawrence Levesque, Roger	A Syst-OMICS approach to ensuring food safety and reducing the economic burden of Salmonellosis	\$9,708,401	\$3,817,861
Genome Québec	Agriculture	Belzile, François Bélanger, Richard	SoyaGen: Improving yield and disease resistance in short-season soybean	\$8,235,673	\$1,602,591

CENTRE(S)	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
LARGE-SCALE APPLIED RESEARCH PROJECTS					
Genome Prairie	Agriculture	Bett, Kristin Vandenberg, Bert	Application of Genomics to Innovation in the Lentil Economy (AGILE)	\$7,892,793	\$1,463,833
Genome Prairie	Agriculture	Pozniak, Curtis Sharpe, Andrew	Canadian Triticum Applied Genomics (CTAG2)	\$8,809,640	\$1,707,991
Genome Prairie Genome British Columbia	Agriculture	Potter, Andrew Hancock, Robert	Reverse Vaccinology Approach for the Prevention of Mycobacterial Disease in Cattle	\$7,358,606	\$2,872,310
Genome Alberta Genome Prairie	Agriculture	Dyck, Michael Harding, John Kemp, Bob	Application of Genomics to Improve Disease Resilience and Sustainability in Pork Production	\$9,801,714	\$3,799,998
Genome Alberta Ontario Genomics	Agriculture	Miglior, Filippo Stothard, Paul	Increasing feed efficiency and reducing methane emissions through genomics: a new promising goal for the Canadian dairy industry	\$10,306,910	\$3,798,134
Genome British Columbia	Agriculture	Rieseberg, Loren Burke, John	Genomics of Abiotic Stress Resistance in Wild and Cultivated Sunflowers	\$7,879,009	\$3,054,485
Genome British Columbia Ontario Genomics	Agriculture	Foster, Leonard Zayed, Amro	Sustaining and securing Canada's honey bees using 'omic tools	\$7,263,568	\$2,786,531
Genome British Columbia	Energy	Douglas, Carl Mansfield, Shawn	POPCAN: Genetic improvement of poplar trees as a Canadian feedstock	\$9,857,824	\$4,879,623
Genome British Columbia	Environment	Eltis, Lindsay Mohn, William	Harnessing microbial diversity for sustainable use of forest biomass resources	\$7,830,842	\$3,869,965
Genome British Columbia	Environment	Tang, Patrick Isaac-Renton, Judith	Applied Metagenomics of the Watershed Microbiome	\$3,203,986	\$1,582,766
Genome Québec	Environment	Lang, B. Franz Hijri, Mohamed	Improving Bioremediation of polluted soils through Environmental Genomics	\$7,655,763	\$3,789,355
Ontario Genomics	Fisheries	Walker, Virginia Lougheed, Steve Schott, Stephan Van Coeverden de Groot, Peter	Towards a sustainable fishery for Nunavummiut	\$5,652,792	\$2,236,499
Genome British Columbia Genome Québec	Fisheries	Davidson, Willie Bernatchez, Louis	Enhancing Production In Coho: Culture, Community, Catch (EPIC4)	\$9,867,636	\$3,796,906
Genome British Columbia	Forestry	Aitken, Sally Hamann, Andreas	AdapTree: Assessing the adaptive portfolio of reforestation stocks for future climates	\$4,703,159	\$2,320,252
Genome British Columbia	Forestry	Hamelin, Richard	Genomics-Based Forest Health Diagnostics and Monitoring	\$4,250,117	\$2,055,555
Genome Québec Genome British Columbia	Forestry	MacKay, John Bohlmann, Joerg	SMarTForest : Spruce Marker Technologies for Sustainable Forestry	\$10,306,960	\$4,880,949
Genome Alberta	Health	McCabe, Christopher Bubela, Tania	PACE - 'Omics: Personalized, Accessible, Cost-Effective applications of 'Omics technologies	\$4,502,084	\$1,049,258
Genome Québec	Health	Rousseau, Francois Langlois, Sylvie	PEGASUS: PErsonalized Genomics for prenatal Aneuploidy Screening USing maternal blood	\$10,525,682	\$2,409,070
Genome Alberta Genomic Québec	Health	McCabe, Christopher Rousseau, François	Genomics and Personalized Health GE ³ LS Network Program	\$1,996,945	\$998,473
Genome British Columbia	Health	Connors, Joseph Marra, Marco Gascoyne, Randy	Personalized Treatment of Lymphoid Cancer: British Columbia as Model Province	\$10,232,799	\$2,420,000
Genome British Columbia	Health	Harrigan, Richard Montaner, Julio	Viral and Human Genetic Predictors of Response to HIV Therapies	\$4,758,743	\$1,103,367
Genome British Columbia	Health	Penn, Andrew Borchers, Christoph Coutts, Shelagh	Reducing Stroke Burden with Hospital-Ready Biomarker Test for Rapid TIA Triage	\$9,634,996	\$4,755,969



LARGE-SCALE SCIENCE

CENTRE(S)	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
LARGE-SCALE APPLIED RESEARCH PROJECTS					
Genome British Columbia	Health	Sin, Don Ng, Raymond	Clinical Implementation and Outcomes Evaluation of Blood-Based Biomarkers for COPD Management	\$7,100,000	\$1,700,000
Genome Alberta	Health	Cairncross, Gregory	Modeling and Therapeutic Targeting of the Clinical and Genetic Diversity of Glioblastoma	\$8,178,786	\$612,001
Ontario Genomics	Health	McKerlie, Colin Brown, Steve	NorCOMM2 - In vivo models for human disease & drug discovery	\$10,886,281	\$4,900,001
Ontario Genomics	Health	Scherer, Stephen Szatmari, Peter	Autism Spectrum Disorders: Genome to Outcomes	\$9,979,998	\$2,479,999
Ontario Genomics	Health	Stein, Lincoln Godfrey, Tony	Early detection of patients at high risk of esophageal adenocarcinoma	\$3,240,865	\$795,272
Ontario Genomics	Health	Boycott, Kym MacKenzie, Alex	Enhanced CARE for RARE Genetic Diseases in Canada	\$11,892,624	\$2,425,000
Ontario Genomics	Health	Stintzi, Alain Mack, Dave	The Microbiota at the Intestinal Mucosa- Immune Interface: A gateway for personalized health	\$2,961,445	\$716,360
Genome 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	\$9,966,018	\$2,386,180
Genome Québec	Health	Sauvageau, Guy Hébert, Josée	Innovative chemogenomic tools to improve outcome in acute myeloid leukemia	\$11,325,631	\$4,908,515
Genome Québec	Health	Simard, Jacques Knoppers, Bartha Maria	Personalised Risk Stratification for Prevention and Early Detection of Breast Cancer	\$11,761,246	\$2,353,481
Genome Québec	Health	Perreault, Claude Roy, Denis-Claude	Personalized Cancer Immunotherapy	\$13,486,784	\$2,409,386
Genome Québec	Health	Cossette, Patrick Michaud, Jacques Minassian, Berge	Personalized medicine in the treatment of epilepsy	\$11,509,053	\$4,909,616
Genome 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
Genome Québec	Health	Jabado, Nada Majewski, Jacek Pastinen, Tomi	The ICHANGE (International Childhood Astrocytomas iNtegrated Genomics and Epigenomics) Consortium	\$5,122,390	\$1,183,123
EMERGING ISSUES					
Genome Alberta	Agriculture	Bergeron, Michel Blais, Burton	Point-of-Need Gene-Based System for Detection of Priority STEC in Beef	\$1,032,781	\$125,001
Genome Alberta	Agriculture	Zakhartchouk, Alexander Gerdts, Volker	Development of a new generation of modified live virus vaccine for PEDv using reverse genetics system	\$695,500	\$237,144
Genome Alberta	Agriculture	Harding, John Alexandersen, Soren	Enhanced molecular diagnostics and validating genetic resistance to PEDv in pigs	\$325,917	\$118,928
Genome British Columbia	Agriculture	Tang, Patrick Himsworth, Chelsea Prystajecy, Natalie	Genomic Analysis of Wetland Sediment as a Tool for Avian Influenza Virus Surveillance in Wild Waterfowl	\$310,450	\$99,600
Genome British Columbia	Mining	Fraser, Lauchlan Baldwin, Sue	Metagenomics to assess impacts of the Mount Polley Mine tailings dam breach on associated ecosystems	\$286,400	\$63,134

CENTRE(S)	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
NATIONAL AND INTERNATIONAL INITIATIVES					
Ontario Genomics	Environment	Hebert, Paul	International Barcode of Life Project (iBOL) (3 years)	\$22,895,657	\$7,335,002
Ontario Genomics	Health	Edwards, Aled Arrowsmith, Cheryl	Structural Genomics Consortium III	\$81,026,001	\$10,000,000
Ontario Genomics	Health	Edwards, Aled Arrowsmith, Cheryl	Structural Genomics Consortium IV	\$18,182,677	\$1,500,000
Ontario Genomics	Health	Dick, John Wang, Jean	Development of Highly Active Anti-Leukemia Stem Cell Therapy Project	\$32,155,382	\$11,500,001
Ontario Genomics	Health	Mak, Tak	Therapeutic Opportunities to Target Tumor Initiating Cells in Solid Tumors	\$39,974,997	\$2,500,001
Ontario Genomics Genome Alberta	Health	Dirks, Peter Weiss, Samuel	Brain Cancer Stem Cell Dream Team	\$11,791,833	\$8,500,000
Genome Québec Ontario Genomics Genome British Columbia	Health	Knoppers, Bartha Brudno, Michael Friedman, Jan	Canadian International Data Sharing Initiative (CanSHARE)	\$3,287,331	\$1,000,000
Ontario Genomics	Health	Brudno, Michael	Harmonising phenomics information for a better interoperability in the RD field	\$1,068,325	\$333,001
Ontario Genomics	Health	Diamandis, Eleftherios	Netherton Syndrome; from mechanisms to therapies	\$1,389,193	\$333,001
Genome British Columbia	Health	Finlay, Brett Rossant, Janet	Canadian Humans and the Microbiome Program (CIFAR)	\$5,775,000	\$1,000,000
Genome British Columbia	Health	Hieter, Philip Boycott, Kym Rossant, Janet	Canadian 'Rare Diseases: Models & Mechanisms' Network	\$2,300,000	\$200,004
Genome British Columbia	Health	Sanatani, Shubhayan	Improving diagnosis and treatment of catecholaminergic polymorphic ventricular tachycardia	\$1,690,813	\$333,001



LEADING-EDGE TECHNOLOGY

CENTRE(S)	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
GENOMICS INNOVATION NETWORK - CORE OPERATIONS SUPPORT FOR TECHNOLOGY PLATFORMS					
Genome Québec Ontario Genomics	All	Bourque, Guillaume Brudno, Michael	Canadian Centre for Computational Genomics	\$1,053,791	\$1,053,791
Genome Québec Ontario Genomics	All	Awadalla, Philip Stein, Lincoln Fortier, Isabelle Ferretti, Vincent	Canadian Data Integration Centre	\$1,019,078	\$1,019,078
Genome Québec	All	Thibault, Pierre Tyers, Michael	Centre for Advanced Proteomics Analyses	\$756,674	\$756,674
Genome Québec	All	Lathrop, Mark Ragoussis, Ioannis Bourque, Guillaume Pastinen, Tomi	McGill University and Génome Québec Innovation Centre	\$2,188,357	\$2,188,357
Ontario Genomics	All	Wrana, Jeff Gingras, Anne-Claude	Network Biology Collaborative Centre	\$974,939	\$974,939
Ontario Genomics	All	Scherer, Stephen Strug, Lisa	The Centre for Applied Genomics	\$2,068,725	\$2,068,725
Ontario Genomics	All	McKerlie, Colin	Toronto Centre for Phenogenomics	\$1,222,983	\$1,222,983



LEADING-EDGE TECHNOLOGY

CENTRE(S)	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
GENOMICS INNOVATION NETWORK - CORE OPERATIONS SUPPORT FOR TECHNOLOGY PLATFORMS					
Genome Alberta Genome British Columbia	All	Wishart, David Borchers, Christoph	The Metabolomics Innovation Centre	\$2,041,461	\$2,041,461
Genome British Columbia	All	Holt, Rob Marra, Marco	Sequencing Platform at the BC Cancer Agency Genome Sciences Centre	\$2,314,427	\$2,314,427
Genome British Columbia	All	Borchers, Christoph Foster, Leonard	The Proteomics Centre	\$2,262,274	\$2,262,274
GENOMICS INNOVATION NETWORK - TECHNOLOGY DEVELOPMENT PROJECTS					
Genome Québec Ontario Genomics	All	Bourque, Guillaume Brudno, Michael	Canadian Centre for Computational Genomics	\$1,062,606	\$526,895
Genome Québec	All	Lathrop, Mark Ragoussis, Loannis Pastinen, Tomi Bourque, Guillaume	McGill University and Génome Québec Innovation Centre	\$3,293,977	\$761,522
Ontario Genomics	All	Wrana, Jeff Gingras, Anne-Claude	Network Biology Collaborative Centre	\$905,892	\$452,360
Ontario Genomics	All	Scherer, Stephen Strug, Lisa	The Centre for Applied Genomics	\$1,487,169	\$743,196
Ontario Genomics	All	McKerlie, Colin	Toronto Centre for Phenogenomics	\$1,018,748	\$501,933
Genome Alberta Genome British Columbia	All	Wishart, David Borchers, Christoph	The Metabolomics Innovation Centre	\$1,856,377	\$938,790
Genome British Columbia	All	Holt, Robert Marra, Marco	Sequencing Platform at the BC Cancer Agency Genome Sciences Centre	\$2,000,000	\$999,866
Genome British Columbia	All	Borchers, Christoph Foster, Leonard	The Proteomics Centre	\$2,070,256	\$999,815
GENOMICS INNOVATION NETWORK - COLLABORATIVE PROJECT					
Genome British Columbia	Health	Hirst, Martin	Canadian Epigenetics, Environment and Health Research Consortium Network	\$2,000,000	\$1,000,000
BIOINFORMATICS AND COMPUTATIONAL BIOLOGY					
Ontario Genomics	Agriculture	Lukens, Lewis Griswold, Cortland	Applying genomic signal processing methods to accelerate crop breeding	\$220,000	\$220,000
Ontario Genomics	Agriculture	Provart, 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
Genome 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

CENTRE(S)	SECTOR	LEADER(S)	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
BIOINFORMATICS AND COMPUTATIONAL BIOLOGY					
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	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	Health	Parkinson, John	Leveraging Meta-Transcriptomics for Functional Interrogation of Microbiomes	\$249,951	\$87,483
Ontario Genomics	Health	Brudno, Michael Bader, Gary	MedSavant: An integrative framework for clinical and research analysis of human genomes	\$998,546	\$499,273
Ontario Genomics	Health	Stein, Lincoln	Pathway and Network Visualization for Personal Genomes	\$249,999	\$62,499
Ontario Genomics	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
Genome Québec	Health	Waldispuhl, Jerome Blanchette, Mathieu	A Development and Deployment Platform for Citizen Science Games in Genomics	\$249,318	\$62,330
Ontario Genomics	Health	Stein, Lincoln	Advancing Big Data Science in Genomics Research project - The Cancer Genome Collaboratory	\$5,999,860	\$2,000,000



TRANSLATION

CENTRE(S)	SECTOR	ACADEMIC/ USER LEADERS	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
GENOMIC APPLICATIONS PARTNERSHIP PROGRAM (GAPP)					
Genome 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 Québec	Agriculture	Labrie, Steve/ Duquette, 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	Agriculture	Yoshioka, Keiko/ Somers, Daryl	Genomics for a Competitive Greenhouse Vegetable Industry	\$2,416,624	\$802,648



TRANSLATION

CENTRE(S)	SECTOR	ACADEMIC/ USER LEADERS	TITLE	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
GENOMIC APPLICATIONS PARTNERSHIP PROGRAM (GAPP)					
Genome Prairie	Agriculture	Vujanovic, Vladimir/ Riley, Ray	Augmenting the Plant Microbiome to Improve Crop Yield and Stress Resilience	\$16,143,997	\$1,943,371
Genome Prairie	Agriculture	Weselake, Randall/ Tahir, M	Enhancement of commercial utilization of canola oil and meal by manipulation of cellular and sub-cellular metabolism involving fats and carbohydrates	\$961,392	\$320,000
Genome Prairie	Environment	Levin, David/ Ducharme, Shawna	Fibre Composite and biomatrix genomics (FiCoGEN) - application to the ground transportation industry	\$3,315,000	\$1,105,000
Genome Alberta	Agriculture	Weselake, Randall/ Knauf, Vic	Application of Genomics for Increasing Seed Oil Content in Soybean	\$339,287	\$113,000
Genome Atlantic	Fisheries	Rise, Matthew/ Taylor, Richard	Biomarker Platform for Commercial Aquaculture Feed Development	\$3,804,456	\$1,093,988
Genome Atlantic Ontario Genomics	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	\$3,797,739	\$1,265,930
Genome Québec	Forestry	Bousquet, Jean/ Smith, Guy	Fast Tests for Rating and Amelioration of Conifers (FastTRAC)	\$3,364,420	\$1,122,043
Genome British Columbia Genome Quebec	Forestry	Hamelin, Richard/ Duff, Cameron	Protecting Canada's Forests against Invasive Alien Species by Next Generation Biosurveillance	\$2,430,000	\$810,000
Genome Québec	Health	Bergeron, Michel/ Allibert, Patrice	Expanding the Molecular Point-Of-Care Test Menu with Two Gram-Positive Cocci	\$5,711,781	\$1,740,577
Ontario Genomics	Health	Liu, Peter/ Bucklar-Suchankova, Gabriela	Cardiovascular Biomarker Translation (CBT) Program	\$5,904,662	\$1,953,663
Ontario Genomics	Health	Kennedy, James/ Altar, Anthony	Clinical Utility and Enhancements of a Pharmacogenomic Decision Support Tool for Mental Health Patients	\$5,994,758	\$1,981,184
Ontario Genomics	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	Health	Kelley, Shana/ Graham, Jack	Development of low cost diagnostic platform for infectious disease testing	\$5,976,619	\$1,979,494
Ontario Genomics	Health	Keshavjee, Shaf/ Hartnett, Thomas	Novel Rapid Diagnostic Tools for Lung Transplantation: Bringing Omics to the Bedside	\$6,000,000	\$2,000,000
Ontario Genomics	Health	Kamel-Reid, Suzanne/ Sumner, Jeff	Towards a national framework for cancer genome profiling in Canadian hospitals	\$6,000,000	\$1,999,999
Ontario Genomics	Health	Wang, Jean/ Uger, Robert	SIRPαFc: Translating Genomics Research Into a Novel Cancer Immunotherapy	\$3,428,274	\$1,106,079
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)	\$979,965	\$408,789



SHARING OF
MEDICAL DATA



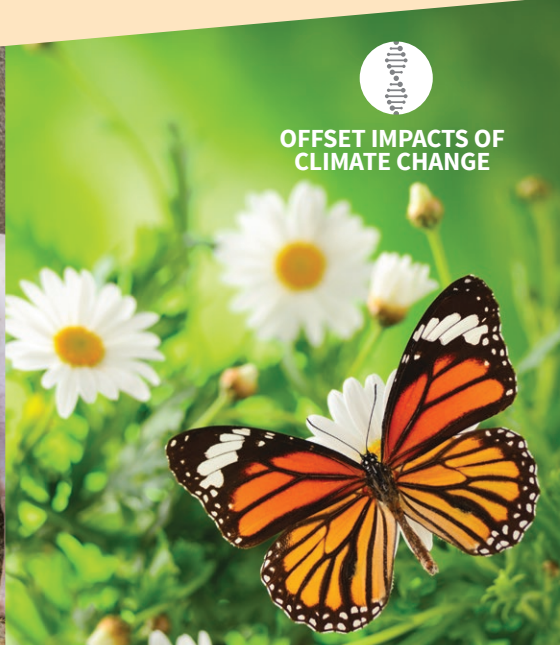
MORE
NUTRITIOUS
FOOD



MITIGATE
ENVIRONMENTAL
IMPACT



IMPROVE
BREEDING OF
LIVESTOCK



OFFSET IMPACTS OF
CLIMATE CHANGE

GENOME CENTRE FUNDING

THE UNIQUE AND HIGHLY EFFECTIVE model under which Genome Canada operates calls for Genome Canada and regionally based Genome Centres across the country to be independently incorporated organizations that work collaboratively in pursuit of agreed to objectives in the area of genomics research. This is a unique approach ensuing collective, pan-Canadian action in determining priorities and delivering programs. The regional Centres' important role ensures the integrity of the Genome Canada model which, with its national breadth and regional depth, contributes to the success of the genomics enterprise.

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 Genomics Innovation Network Nodes (technology platforms) 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 Centres are required to secure funding from other sources, primarily provincial, for their core operations. Genome Canada's funding, therefore, represents a portion of the total costs necessary to fulfill their mandates.

The following table shows funding to Centres for the 2015-2016 fiscal year.



GENOME CENTRE SUPPORT

CENTRE	PRESIDENT & CEO	TOTAL FUNDING	GENOME CANADA CONTRIBUTION
Genome Atlantic	Armstrong, Steve	\$1,469,600	\$734,800
Genome Québec	Godbout, Martin (Interim)	\$1,760,000	\$880,000
Ontario Genomics	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

GOVERNANCE

GENOME CANADA IS GOVERNED by a Board of Directors comprising of no less than nine, but not more than 16 directors. The Directors are recruited from the academic, private and public sectors and offer a range of expertise including genomics research, genomics in society, bioinformatics, academia, government sector, business, commercialization and communications. 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.

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. The composition of this committee consists of individuals from Canada and abroad who are internationally recognized in the science and industry sectors and in fields relevant to genomics in society.

NUMBER OF MEETINGS HELD BY THE BOARD AND ITS COMMITTEES IN 2015-16

Board of Directors	7
Audit and Investment Committee	4
Governance, Election and Compensation Committee	5
Programs Committee	6
Science and Industry Advisory Committee	5



**LEADING-EDGE
TECHNOLOGY**



**NON-INVASIVE
TESTING**

BOARD, MANAGEMENT AND STAFF

BOARD OF DIRECTORS

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(Chair)
Past President (retired)
CropLife Canada
London, Ontario

Moura Quayle

(Vice Chair)
Director, University of British
Columbia
Liu Institute for Global Issues,
Faculty of Arts
Professor, Strategic Design,
Sauder School of Business at UBC
Vancouver, British Columbia

Fiona Brinkman

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

Abdallah Daar

Professor, Health Sciences
and Surgery
University of Toronto
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Clementia Pharmaceuticals
Montreal, Quebec

Jim Farrell

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Ottawa, Ontario

Janice Y. Lederman

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

Marc LePage

President and CEO
Genome Canada
Ottawa, Ontario

Kim McConnell

Founder and Former CEO
AdFarm
Calgary, Alberta

Pierre Meulien

(to August 2015)
President and CEO
Genome Canada
Ottawa, Ontario

Eddy Rubin

Geneticist and Medical Researcher
Lawrence Berkeley National
Laboratory
Berkeley, California, USA

Janet Wightman

Managing Director
Kincannon & Reed
Regina, Saskatchewan

Barbara Wold

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

Donald Ziraldo

Co-founder
Inniskillin Wines
St. Catharines, Ontario

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President
Canadian Institutes of Health
Research
Ottawa, Ontario

Ted Hewitt

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Social Sciences and Humanities
Research Council of Canada
Ottawa, Ontario

John R. McDougall

President
National Research Council Canada
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Gilles G. Patry

President and CEO
Canada Foundation for Innovation
Ottawa, Ontario

B. Mario Pinto

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

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

Anne-Christine Bonfils

(Vice Chair)
Research Program Manager
National Research Council of Canada
Ottawa, Ontario

Doane Chilcoat

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

Stacey B. Gabriel

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

Joan Lunney

Research Scientist
Beltsville Agricultural Research
Center
Beltsville, Maryland, USA

Eric M. Meslin

President and CEO
Council of Canadian Academies
Ottawa, Ontario

Francis Ouellette

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

Dan Roden

Principle Investigator
NIH Pharmacogenomics Research
Network (PGRN)
National Human Genome Research
Institute Electronic Medical Records
and Genomics (eMERGE)
Vanderbilt University
Nashville, Tennessee, USA

Julie Segre

Senior Investigator
National Human Genome Research
Institute, National Institute of Health
Chief, Translational and Functional
Genomics Branch
Head, Microbial Genomics Section
Bethesda, Maryland, USA

Paul A. Willems

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

OFFICERS**Lorne Hepworth**

Chair

Moura Quayle

Vice-Chair

Jean Brunet

Stein Monast LLP
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

Carol Anne Esnard

(until June 2015)
Chief Administrative Officer

Marc LePage

President and CEO

Pierre Meulien

(until August 2015)
President and CEO

Karl Tibelius

Vice-President, Genomics Programs

GENOME CANADA STAFF**Marc LePage**

President and CEO

Pierre Meulien *(until August 2015)*

President and CEO

Koko Bate Agborsangaya

Program Manager

Darlene Arseneau

Vice-President, Corporate Services
& CFO

Naveed Aziz

Director, Technology Programs

Cindy Bell

Executive Vice-President,
Corporate Development
Interim President and CEO
(August 2015 – January 2016)

Natalie Brender

National Director, Genomics
in Society

Paul-Émile Cloutier

Vice-President, Advocacy and
External Relations

Kim Corbett

Program Manager

Karen Dewar

Director, Genomics Programs

Carol Anne Esnard

(until June 2015)
Chief Administrative Officer

Julie Edwards

(until July 2015)
Director, Corporate Development

Samantha Evans

Director, Performance and Evaluation

Lorna Jackson

Program Manager

Andrea Matyas

Director, Communications

Hélène Meilleur-Landry

Director, Events & Sponsorships

Michael Midmer

Director, Genomic Applications
Programs

Lucy Sorensen

Administrative Assistant

Kate Swan

Associate Director, Corporate
Development

Helina Tadesse

Corporate Development
Manager

Normand Therrien

Director, Project Finance

Karl Tibelius

Vice-President, Genomics Programs

Rob Tweedy

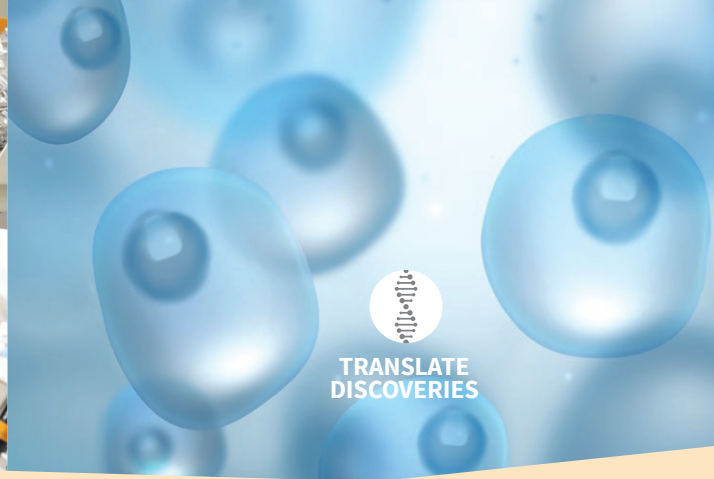
Director, Information Services

Brigitte Vaillant

Executive Assistant to the
President and CEO

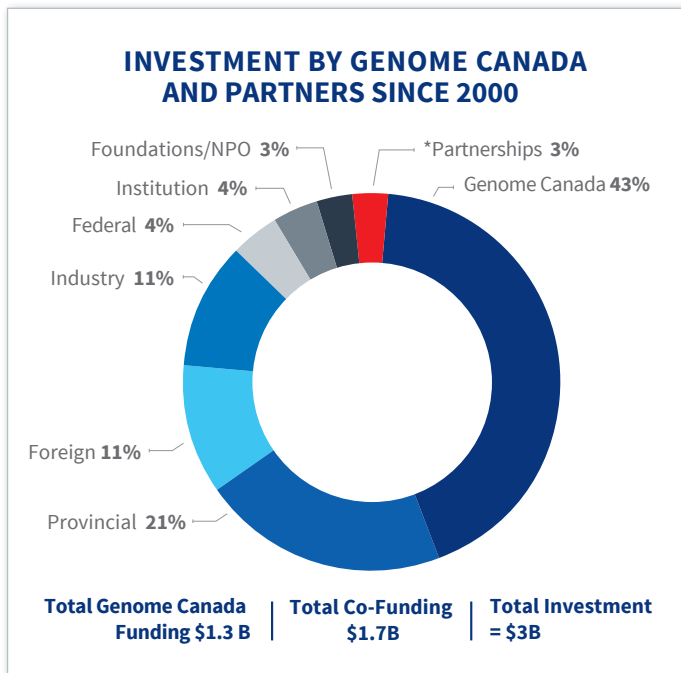


LARGE-SCALE SCIENCE



TRANSLATE DISCOVERIES

MANAGEMENT DISCUSSION



* The partnerships category represents organizations that partner with Genome Canada to create a pool of funds up front to be applied to a specific funding opportunity (as opposed to participating as a project co-funder).

GENOME CANADA HAS INVESTED \$3 billion in genomics research since its creation in the year 2000. The federal government provided \$1.3 billion including investment income of this funding with the remaining \$1.7 billion from national and international partners including provincial, private and public. The federal government continues to invest in Genome Canada and its objectives and announced in federal Budget 2016 a further \$237.2 million. Genome Canada investments support large-scale research, access to leading-edge technology, translation, and operations of the six regional Genome Centres and Genome Canada.

All research projects, with few exceptions, require co-funding from other parties, including provinces, universities, private sector, and other national and international organizations. The funding ratio of Genome Canada to co-funding was 1:1 prior to 2012, however in the 2014 Funding Agreement the required funding ratio was increased for some programs so that overall the ratio is now approaching 1:2.

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 platforms located within its region.

2015-2016

FINANCIAL STATEMENT HIGHLIGHTS

IN THE YEAR ENDING March 31, 2016 Genome Canada received \$67.4 million in annual cash flow funding from the federal government compared to \$69.8 million in the previous year. Genome Canada's 2015-16 financial statement's total expenditures for projects and operations was \$53.1 million compared to \$65.8 million in the previous year.

Genome Canada dispersed in the year a total of \$45.9 million for the funding of large-scale research projects, access to leading edge technology, translation, and operations of the Centres, in comparison to \$59.9 million dispersed in fiscal 2014-15. The difference is primarily due to a number of multiyear projects being in their final years, combined with newly launched projects in their early years, both scenarios incurring lessor costs in 2015-16. From total disbursements of \$45.9 million in fiscal year 2015-16, \$32.6 million was in support of research projects, \$8.5 million for the Genomics Innovation Network and \$4.8 million for funding of the regional Genome Centres.

Genome Canada's cost of operations totals \$7.2 million to support operational activities in the areas of genomics programs, corporate development and fundraising, communications, governance, performance and evaluation, Genomics in Society activities and administration. The previous year's total was \$5.9 million. The difference in cost is a result of the increase in the number of genomics programs launched and awarded during fiscal 2015-16.

Genome Canada's operating costs include the following statement of remuneration. The Board of Directors and Members do not receive remuneration for their services however, Genome Canada does pay the expenses incurred by Directors in the performance of their duties. For Officers and Employees of Genome Canada, there is a compensation policy that





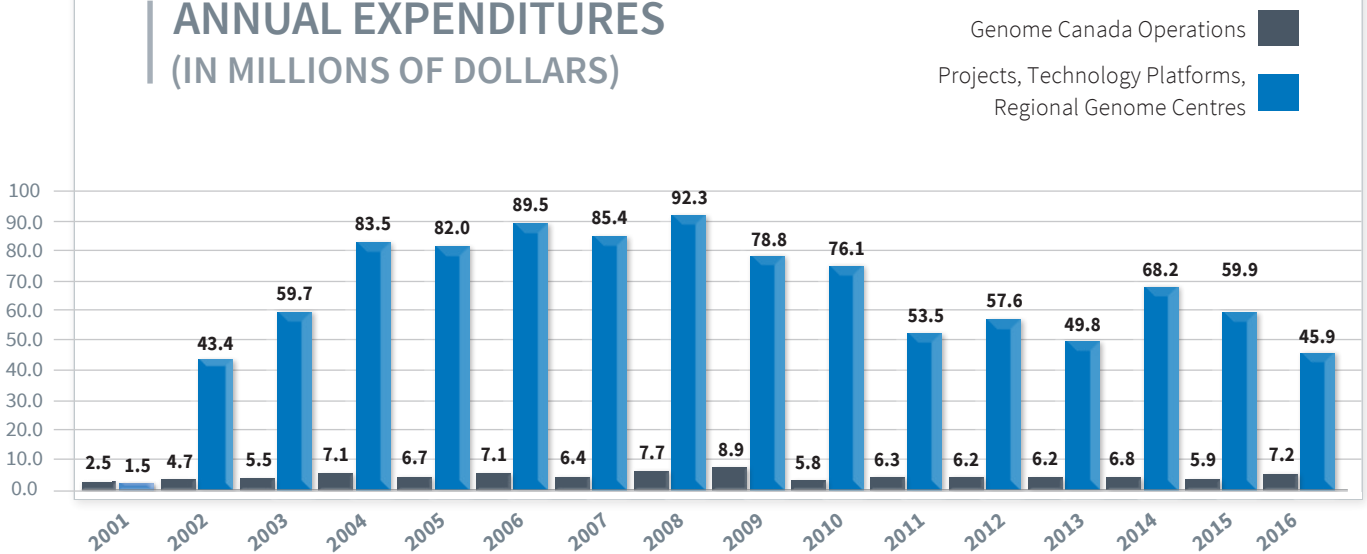
includes job classifications and related salary ranges for all positions except the CEO. Genome Canada employees are eligible for performance awards ranging from zero to twenty five per cent. For positions which exceeded \$100,000 in the year ended March 31, 2016 the following are the annual salary ranges:

- President and CEO (Officer) – salary range \$300,000 to \$425,000
- Vice-Presidents (Officers) – 4 positions – salary range \$131,296 to \$196,944
- Director (Band 4) – 5 positions – salary range \$102,029 to \$153,044
- Director (Band 3) – 5 positions – salary range \$79,286 to \$118,928

As at March 31, 2016, a total of \$44 million remains as deferred contributions, representing funding received year to date for disbursements that will be made in subsequent years for approved research projects and operational support.

Genome Canada has investments at March 31, 2016 valued at market at \$44 million. These investments are administered in accordance with the Board of Directors' approved Investment policy and in accordance with the terms and conditions of the Contribution Agreement with the federal government. The investment policy has remained unchanged this fiscal year.

ANNUAL EXPENDITURES (IN MILLIONS OF DOLLARS)



2015-2016

FINANCIAL OUTLOOK

THE FEDERAL BUDGET 2016 has a further investment in Genome Canada objectives of \$237.2 million. The agreement for this funding has not yet been finalized. The current funding agreement in place 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 the years ending March 31, 2017. The new \$237.2 million funding is expected to fund operations to 2020.

Research projects, technology platform investments and competitions will continue to be conducted in 2016-17 including funding opportunities for large-scale research projects, bioinformatics and computational biology, and other strategic priorities and emerging issues. Genome Canada continues to invest in the development and refinement of all its sector strategies, health, agriculture, fisheries & aquaculture, forestry, environment, mining and energy and maintains a focus on genomics in society.

Funding from Innovation, Science and Economic Development 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 \$66.9 million is expected to be received in 2016-17 to fund already approved research projects and operations. In addition, there are deferred contributions of \$44 million as at March 31, 2016 that are committed to research projects approved through previous competitions and are scheduled for disbursement in 2016-17 and subsequent fiscal years.



**IMPROVE
HARVEST**

Financial statements of

Genome Canada

March 31, 2016

Genome Canada

March 31, 2016

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



Deloitte LLP
1600 - 100 Queen Street
Ottawa ON K1P 5T8
Canada

Tel: (613) 236-2442
Fax: (613) 236-2195
www.deloitte.ca

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, 2016, 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 judgment, 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.

AUDITOR'S REPORT

Opinion

In our opinion, the financial statements present fairly, in all material respects, the financial position of Genome Canada as at March 31, 2016, 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.

A handwritten signature in blue ink that reads "Deloitte LLP".

Chartered Professional Accountants
Licensed Public Accountants

June 23, 2016

Genome Canada

Statement of financial position as at March 31, 2016

(in thousands of dollars)

	2016	2015
	\$	\$
Assets		
Current assets		
Cash and cash equivalents (Note 3)	32,736	26,815
Interest receivable	83	-
Other receivables	135	112
Prepaid expenses	158	165
	33,112	27,092
Investments (Note 4)	11,863	2,999
Capital assets (Note 5)	118	159
	45,093	30,250
Liabilities		
Current liabilities		
Accounts payable and accrued liabilities	908	634
Deferred contributions (Note 6)	44,067	29,457
Deferred contributions related to capital assets (Note 7)	118	159
	45,093	30,250
Commitments (Note 10)		
Contingencies (Note 11)		
Net assets	-	-
	45,093	30,250

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, 2016

(in thousands of dollars)

	2016	2015
	\$	\$
Revenue		
Amortization of deferred contributions (Note 6)	53,039	65,738
Amortization of deferred contributions related to capital assets (Note 7)	50	17
	53,089	65,755
Expenses		
Contributions to Centres and approved projects	45,850	59,888
General and administrative	4,633	4,516
Program management	950	316
Advocacy and external relations	816	582
Corporate development	259	118
Governance	188	147
Performance and evaluation	142	55
Genomics in Society	90	64
Workshops and symposia	85	50
Amortization of capital assets	50	17
Sector strategy development	26	2
	53,089	65,755
Excess of revenue over expenses and net assets, end of year	-	-

See accompanying notes to financial statements

Genome Canada

Statement of cash flows

year ended March 31, 2016

(in thousands of dollars)

	2016	2015
	\$	\$
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	50	17
Change in fair value of investments	52	57
Recognition of deferred contributions (Note 6)	(53,039)	(65,738)
Recognition of deferred contributions related to capital assets (Note 7)	(50)	(17)
Excluded from the increase in deferred contributions (Note 9)	(48)	(161)
	(53,035)	(65,842)
Interest received on investments	274	382
Portfolio investment management	(59)	(48)
Grants received from Government of Canada (Note 6)	67,400	69,800
Deferred contributions related to capital assets	9	151
Change in operating assets and liabilities:		
Decrease (increase) in other receivable	(23)	38
Decrease in prepaid expenses	7	30
Increase (decrease) in accounts payable and accrued liabilities	274	(195)
	14,847	4,316
Investing		
Purchase of investments	(36,898)	(11,264)
Proceeds on disposal of investments	27,981	8,269
Purchase of capital assets	(9)	(151)
	(8,926)	(3,146)
Net cash and cash equivalent inflow	5,921	1,170
Cash and cash equivalents, beginning of year	26,815	25,645
Cash and cash equivalents, end of year	32,736	26,815

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, 2016

(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, forestry, fisheries and aquaculture, energy, mining and the environment;
- (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 related 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, 2016

(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	20%
Computers and software	50%
Telecommunications 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 \$208 (2015 - \$204).

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

	2016	2015
	\$	\$
Cash	711	547
Short-term investments	32,025	26,268
	32,736	26,815

4. Investments

	2016		2015	
	Fair value	Cost	Fair value	Cost
	\$	\$	\$	\$
Federal government bonds	4,662	4,667	-	-
Provincial government bonds	3,010	3,022	2,999	2,996
Corporate bonds	4,191	4,223	-	-
	11,863	11,912	2,999	2,996

The interest rates at the end of the year range from 0.98% to 5.28% (2015 - 0.9%) and mature at varying dates in 2017 (2015 – 2016 to 2017).

Genome Canada

Notes to the financial statements

March 31, 2016

(in thousands of dollars)

5. Capital assets

			2016	2015
	Cost	Accumulated amortization	Net book value	Net book value
	\$	\$	\$	\$
Furniture and fixtures	188	168	20	16
Computer and software	177	176	1	2
Telecommunications equipment	32	32	-	1
Leasehold improvements	152	55	97	140
	549	431	118	159

Cost and accumulated amortization at March 31, 2015, amounted to \$541 and \$382, 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, 2016, the Corporation received \$7,400 under the agreement dated March 31, 2008, \$13,500 under the agreement dated January 3, 2012, \$7,500 under the agreement dated January 25, 2013, and \$39,000 under the agreement dated March 10, 2014. The changes in the deferred contributions balance for the year are as follows:

	2016	2015
	\$	\$
Balance, beginning of year	29,457	25,183
Add: grants received	67,400	69,800
Add: investment income	258	363
Less: amounts recognized to revenue	(53,039)	(65,738)
Less: amounts invested in capital assets	(9)	(151)
Balance, end of year	44,067	29,457

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:

	2016	2015
	\$	\$
Balance, beginning of year	159	25
Add: acquisition of capital assets	9	151
Less: amounts amortized to revenue	(50)	(17)
Balance, end of year	118	159

Genome Canada

Notes to the financial statements

March 31, 2016

(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

	2016	2015
	\$	\$
Gain (loss) on disposal of investments	42	(6)
Amount transferred to capital assets	(9)	(151)
Fair value adjustment	(81)	(4)
	<u>(48)</u>	<u>(161)</u>

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, 2016, the payments committed are approximately \$49,673 in 2017 and \$38,790 for other future years.

Consulting

The Corporation has entered into a consulting agreement expiring in the 2017 fiscal year. The payments committed amount to \$32.

Operating leases

The Corporation leases its premises and equipment under long-term operating leases, which expire at various dates between 2017 and 2019. The minimum aggregate lease payments are approximately as follows:

	\$
2017	141
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, 2016

(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.

13. Comparative figures

Certain comparative figures have been reclassified to conform with the current year's presentation.



**STRONG
FORESTS**

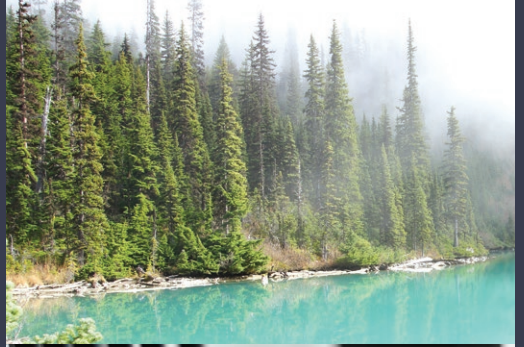
We wish to thank the Government
of Canada for its leadership in
genomics and continued
support of Genome Canada.



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