2015 16

GenomeQuébec

ANNUAL REPORT

Genomics: Reaching Forward

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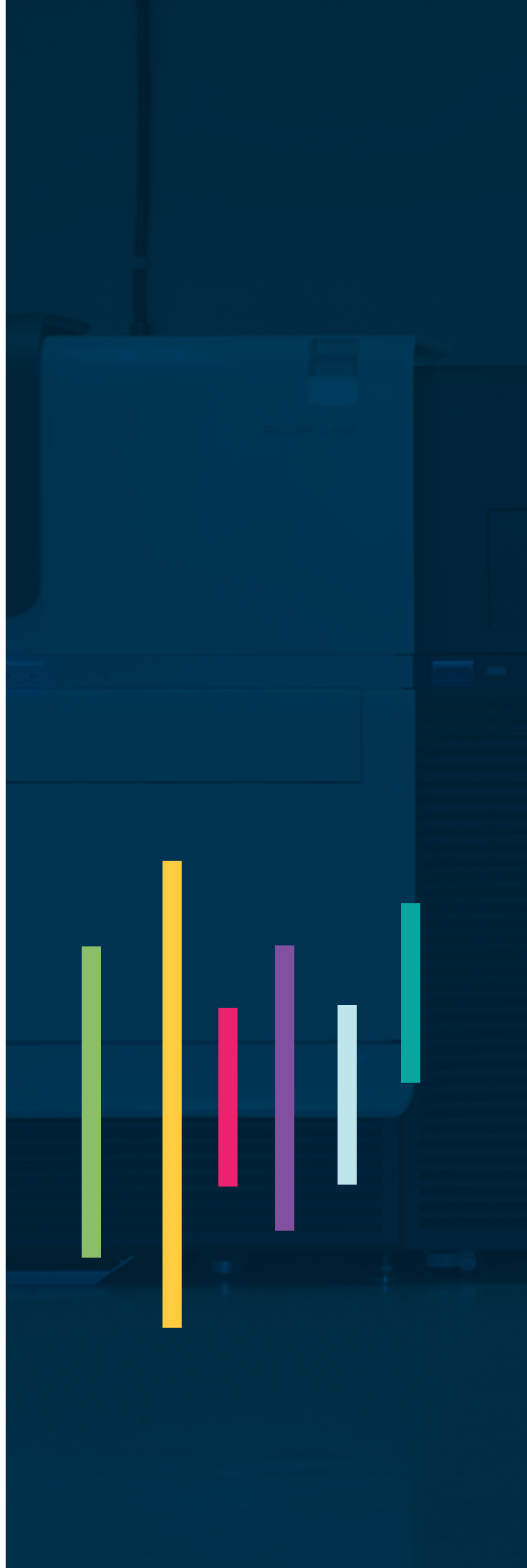

ABOUT GÉNOME QUÉBEC

Vision

Making Genomics work for Citizens and Society

Mission

In partnership with national and international leaders in life sciences, Génome Québec contributes to strengthening the competitiveness of the genomics innovation system in order to maximize its socioeconomic impact in Québec, by funding major genomic research initiatives and putting in place the tools necessary for scientific and strategic development in the field.

Special thanks to our partners

GenomeCanada

Économie, Science et Innovation Québec

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MESSAGE FROM THE CHAIR OF THE BOARD

MARTIN GODBOUT

This year, Génome Québec celebrated its 15th anniversary. Our performance in recent years has been outstanding, particularly with the rapid and active implementation of genomics technology in key sectors of the Québec economy.

We have now reached a tipping point in the development of this disruptive technology. For instance, the integration of genomics into the health care system is now a reality. The call for proposals launched by the MSSS (Québec's department of health and social services) in a Québec-based clinical genomics platform just goes to prove that the shift is inevitable.

The transition, however, will no doubt raise many questions regarding the proper practices and procedures that must be put in place to ensure maximum benefits for patients. Many challenges will need to be addressed on both the technological and organizational fronts. As such, success will entail integrating several technological fields: artificial intelligence (access, analysis and interpretation of data), education, the training of the next generation of health professionals, funding and, most important, the potential profitability of such a shift.

In addition, the applications and solutions provided by genomics for use in other sectors, such as forestry, agrifood and sustainable development, are expanding at an accelerated rate. In years to come, it will be critical to integrate these solutions into key sectors of the economy. We are in the midst of a biotechnological revolution. The future competitiveness of our most strategic economic sectors will inevitably involve the integration of genomics-based innovations.

Seizing opportunities in the digital age

The time is now to explore the many opportunities that lie before us here in Québec. As previously mentioned, one of our greatest challenges is the management of Big Data – or artificial intelligence – and the various issues it raises. Our ability to analyze and interpret a phenomenal quantity of genomics data will make all the difference in our capacity to remain competitive internationally.

As a multi-sector, cross-disciplinary science, genomics must fully embrace the digital age and acquire the right tools to successfully understand the complexity of biological phenomena. Only if this condition is met will genomics have the capacity to make a meaningful contribution to public health, whether in health care, agrifood, forestry, food safety or climate change.

Rising to this challenge involves ensuring continuity and preserving our assets. In that light, we salute the federal government's major $237 million in funding to Genome Canada. We are equally enthusiastic about the coming implementation by the Québec government of a research and innovation strategy. With such backing, Génome Québec can be expected to fulfil its mission of putting genomics to work for citizens and society.

Last but not least, I would like to acknowledge the remarkable work of the members of the Board of Directors who, by providing their unparalleled expertise and experience, contribute to the growth and vitality of this promising sector in Québec. I also take this opportunity to extend many thanks to the members of the Génome Québec management team.

MESSAGE FROM THE MANAGEMENT TEAM

Our accomplishments this year have clearly demonstrated that genomics research has now reached a tipping point in terms of integration and innovation here in Québec.

This new reality comes with a host of challenges on several fronts, including researcher support, public policy, education and public outreach. The diversification of sectors and the growing number of competitions have also generated a significant increase in the volume of scientific and mobilization activities, leading to major growth management issues.

An economic analysis on the impact of genomics research

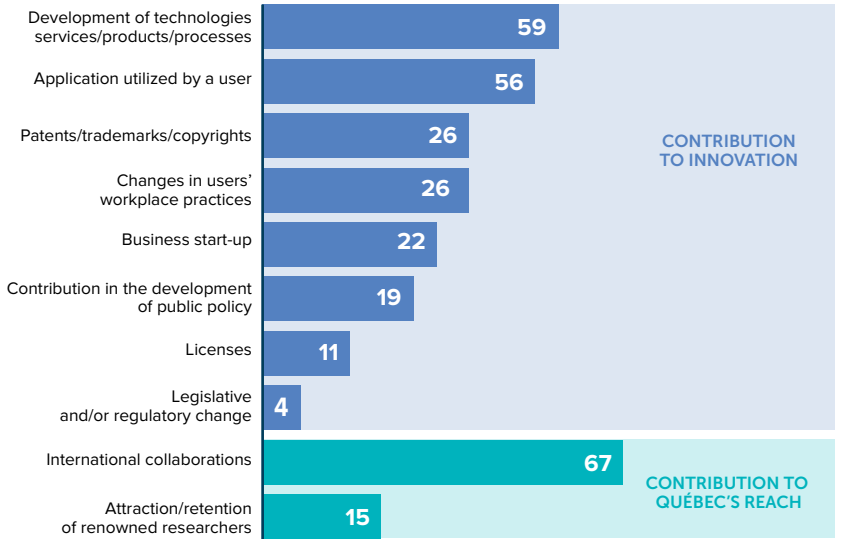
To illustrate the very real and positive contribution of genomics investments, Génome Québec mandated SECOR/KPMG to produce a report on the economic contribution of genomics in Québec.

The study findings were both telling and encouraging. They indicated that genomics is not limited to traditional sectors, such as health and agrifood, but that it has far-reaching ramifications in many other areas, including natural resources, the environment and bioindustrial processes, not to mention its legal implications. The report also demonstrated that genomics has made its way into corporations seeking innovative solutions to help them boost their competitiveness in the marketplace. We are witnessing the fast-paced growth and diversification of industrial applications, and this means business opportunities for an increasing number of Québec companies working in key sectors of our economy.

From left to right: Claude Lamarre, Stéphanie Lord-Fontaine, Ève-Stéphanie Sauvé, Daniel Tessier and Marie-Kym Brisson

Economic/commercial contribution of research and its influence

Key contributions of research projects *(as a % of total projects)*



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The study confirms that Québec holds a prominent position here in Canada. The infrastructures and support provided by Génome Québec have made a tremendous contribution to the scientific community by helping it stand out both in Canada and abroad.

Through the high-performance platforms and equipment we make available, genomics research has been developing at an accelerated pace, while enhancing its ability to provide real-world applications.

Genomics set to address more diversified issues: The case of climate change

Genomics is a cross-disciplinary field by nature, and therefore it has the capacity to act on many fronts. In the wake of COP-21, for example, we brought together a round table of researchers and experts specialized in climate change to discuss how genomics could pave the way for promising and sustainable solutions to this complex issue. On November 30, 2015, a conference on climate change was held as part of the Montréal Summit on Innovation at the Montréal Board of Trade and a working document was subsequently drafted.

The actions we have taken this year have aimed to promote genomics-derived solutions among various sectors of activity. This both reflects our mission and highlights some of the main challenges facing our management team here at Génome Québec.

In closing, we would like to acknowledge Génome Québec employees, whose constant efforts and professionalism make it possible to successfully rise to our many challenges day by day. We thank each and every one of them most sincerely.

Conference on climate change was held as part of the Montréal Summit on Innovation at the Montréal Board of Trade. Photo credit: Éric Carrière pour Cosmos Image

SCIENTIFIC OUTREACH

An experienced team

In 2015-2016, our Scientific Affairs team stepped up to the challenge, managing the launch of ten new competitions and providing support to 98 research teams in four key sectors of activity: human health, agrifood, forestry and sustainable development. It also oversaw the technological development of the Genomics Innovation Network (GIN), disruptive technologies, bioinformatics and the Canadian International Data Sharing Initiative to Accelerate Health-Care Innovation.

By way of comparison, three times more research teams benefited from Génome Québec's support this year versus 2014-2015. Volume is one indicator of the expertise and experience our team has acquired over the years, but so is the diversification of the areas of activity involved. Mining is yet another sector that has been developed this year alongside new partners currently participating in Genome Canada competitions.

The quality of the support offered to the Québec scientific community has brought about major successes in the relatively new sector of agrifood and in projects under the Genomic Applications Partnership Program, resulting in ground-breaking collaborations with new companies and research users.

Lead investigators whose large-scale projects have launched this year include Richard Bélanger, François Belzile, Lawrence Goodridge, Roger C. Levesque, Louis Bernatchez, Michel G. Bergeron and Gerald Batist.

The Scientific Affairs team also ensured the follow-up of a portfolio of 51 projects currently underway. This included administering the research oversight committees composed of more than 50 international experts in human health and agrifood.

A solid performance

In 2015-2016, Genome Canada's total funding envelope for Canadian competitions was close to $61.4 million. Génome Québec secured an impressive 28% of that funding. Given that Québec represents approximately 20% of the GDP, this performance goes to prove how vibrant and dynamic the genomics scientific community is here in the province.[1]

1. Source: Rapport SECOR/KPMG La contribution économique de la génomique au Québec, May 2016

In total, Québec research teams generated $42.5 million in funding this year, a threefold increase compared to the previous year.

Total Genome Canada funding available in Canada	**$61.4M**
Genome Canada funding awarded in Québec	**$17.0M**
Success rate in Québec this year (%)	**28%**
Total budget in Québec *(including co-funding)*	**$42.5M**

Genomics research at a glance: Making a difference in health, sustainable development and forestry

TRAINING T CELLS FOR BATTLE

CLAUDE PERREAULT, MD, F.R.C.P. (C)
IRIC, Université de Montréal

Packed in our bone marrow are factories that make blood cells. Every day, they churn out millions of red and white cells, which are then released into the bloodstream to replace the ones that have died.

But things can go wrong in these factories. Normally, new cells are produced when bone marrow stem cells divide. These then develop into specific types of cells. When a stem cell goes awry (due to a change in its genome, for instance), it can start over-producing non-functioning cells. The blood, flooded with useless cells, can no longer do its job. The result is leukemia.

Contrary to popular belief, leukemia is not cancer of the blood, but a group of cancers affecting the bone marrow. A stem cell transplant (a.k.a. bone marrow transplant) is one of the weapons used to battle this disease. It involves taking healthy stem cells from a donor and injecting them into the patient. The goal is to replenish the patient's bone marrow, which has been partially drained of its stem cells by chemotherapy. As with all transplants, the closer the blood relation between donor and recipient, the greater the chances of the intervention's success. Otherwise, the recipient's immune system may fail to recognize the new cells and end up rejecting them.

In response to this challenge, Dr. Claude Perreault of the Institute for Research in Immunology and Cancer (IRIC), had a great idea: Why not use the immune system to our advantage to cure leukemia? "Maybe we can train certain cells to recognize and destroy cancerous ones?" Using his shrewd tactical skills, Dr. Perreault has been busy planning a major attack on cancer.

His simple, yet ingenious plan still requires a donor. But now, instead of collecting bone marrow cells, you only need T cells (or T lymphocytes), a subtype of white blood cells. T cells patrol the body and scan for problems. If they detect foreign cells, they trigger a process to eliminate them.

"We take T cells from the donor and, for 35 days, expose them to a specific antigen from the cancerous cells. What we're doing is training them to recognize the enemy." These "special-ops" T cells are then injected into the patient, where they go on to eradicate the disease by killing the defective cells they encounter. In a matter of weeks or months, the leukemia is gone.

And it works...at least in mice. Human trials are set to begin in a few weeks. "Just like 'traditional' transplants, we need a donor who is a blood relative. The goal is to have the T cells be sufficiently familiar with the cells of the host to wage war on the faulty ones, in both the blood and marrow, but leave the healthy ones unharmed. In other words, they need to speak the same language."

This innovative research was made possible by genetic tools. The antigens present on the surface of the broken-down cells were selected from thousands of potential candidates. Genetic sequencing was then used to make them in the lab. "It's the cells' ID card," Dr. Perreault explains. We created 'fake IDs' and that's how we're teaching the T cells to kill cancer." After their boot camp, these soldiers get sent to the battlefield – the body of the cancer patient – where they will hone in on their targets and do what they were trained to do.

This research builds on Québec's expertise in the production of stem cells for clinical application. According to the Canadian Stem Cell Strategy, Canada must continue to develop this field to preserve its global leadership position. The team spearheading the immunotherapy research is made up of more than 35 people – all highly skilled employees set to become experts in immuno-therapy and personalized medicine.

GENOMICS HELPING TREES WEATHER CLIMATE CHANGE

JEAN BOUSQUET, PhD, Université Laval

"I'm often asked if it's possible to genetically select trees that could resist climate change. I always say, 'yes,' but which changes do we mean?"

Pr. Jean Bousquet talks about his spruce the way a dog breeder speaks of his pure-breds, proudly discussing how to select specimens for improved growth rate, frost tolerance and resistance to budworm. Working out of the Department of Wood and Forest Sciences at Université Laval, Professor Bousquet and his team have recently developed *FastTRAC*, a system of genetic tests that help identify the performance of a seedling when it's only days old. Now, there's no need to wait for it to grow 30 years before figuring out if it's been planted in the right place.

"People ask me if the test can be used to select trees that could better cope with climate change. It's theoretically possible, but first we need to know the exact nature of these changes. Living beings cannot adapt to climate change, per se, only to its specific consequences."

Do we want trees that will resist new kinds of pests? Trees with branches that will support more frequent freezing rain events? Which ones will better withstand drought? There's no such thing as ONE climate change, and even if there was, we would still not be able to discern its full extent.

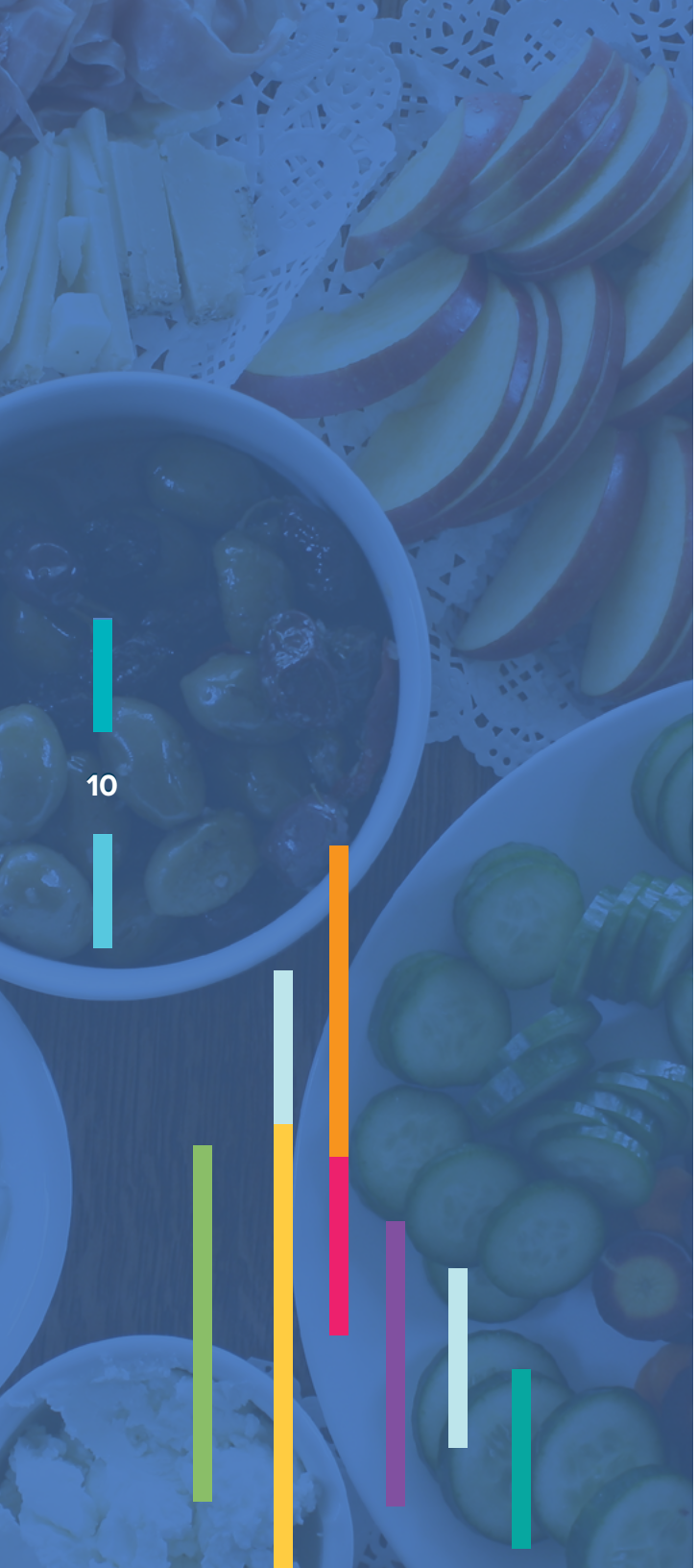
But what if we bred a super tree, one that was superior in every way? "It could work," says Professor Bousquet, "but how do you know if improving one trait won't weaken another? For example, would a tree with better pest resistance give us the same quality wood?"

The problem has not stumped our ingenious researcher. "If you want to tackle global warming, you don't even need to improve every trait; you just need spruce that grow faster. This will reduce the risk horizon. If a tree reaches its commercial height in 30 years rather than 75, it will only be exposed to 30 years of climate variations. This shorter time span means trees will be "less misadapted" than if they had to live through 75 years of changes."

Ensuring the genetic diversity of our tree stocks is another important factor that will help our forests better tackle the changes – both the ones we saw coming and the ones we didn't.

MAJOR ECONOMIC BENEFITS FOR THE INDUSTRY

Compared to conventional tree breeding, the tools developed by Professor Bousquet and his team aim to increase the net value of spruce stocks by approximately 40% and reduce selection time from 30 to 8 years. As a result, improved trees can be planted much faster. The ongoing projects will give forest managers the tools they need to improve tree production. In addition, genomics technology can help develop more tools that can be used to better breed other highly reforested species, such as pine.



GETTING TO KNOW THE EXTENDED *SALMONELLA* FAMILY

ROGER C. LEVESQUE, PhD
IBIS, Université Laval

Salmonella are a group of bacteria typically found in the intestines of animals. They can make their way into our food if certain hygiene measures are not followed. We then end up ingesting the bacteria.

So what happens? It really depends on which bacterium is involved. For example, *Salmonella enterica enterica*, a dreaded subspecies of this large family of bacteria, includes *Typhi*, a variation responsible for typhoid fever. But *Typhi* is only one of the 2,500 strains (serotypes) of the subspecies. Another more common illness, salmonellosis, is also caused by *Salmonella*, hence the name. This relatively common foodborne illness causes diarrhea and vomiting in 88,000 Canadians each year. “It often comes from eating undercooked chicken or fish,” explains Roger C. Levesque.

“But it can also be found on fruit, vegetables, in unpasteurized milk or in any other food that has been in direct or indirect contact with animal excrements. And it can contaminate drinking water.”

At the Institute for Integrative Systems Biology at Université Laval, Professor Levesque and his team are working on developing an accurate genetic profile of the 2,500 *Salmonella* serotypes. Which ones are dangerous? “We have absolutely no idea,” he explains. “In fact, until very recently we weren’t even aware that there were so many strains. We don’t even know if all of them pose a threat or only a few exceptions.”

In partnership with Pr. Lawrence Goodridge of McGill University, the researcher is tackling the question. They are developing a method to catalogue the 2,500 serotypes and, more important, designing a rapid genetic test to identify the serotype of a detected bacterium. At the moment, it takes 7 days to screen *Salmonella*, but with the new test, it will take only 24 hours to find out exactly which serotype is involved. Armed with this information, public health authorities will be able to know if they need to intervene. Since the current safety protocol involves destroying tons of potentially contaminated food at the slightest hint of contamination, the new approach could save millions of dollars.

TECHNOLOGICAL OUTREACH

The technology platforms operated by Génome Québec include the Génome Québec and McGill University Innovation Centre, the CHU Sainte-Justine and Génome Québec Integrated Pediatric Clinical Genomics Centre, the Génome Québec and Centre hospitalier affilié universitaire régional de Chicoutimi (CHAUR) Biobank. These platforms provide a range of services to the scientific community and to industry, including genotyping, gene sequencing, gene expression, epigenomics, bioinformatics and biobanks.

In addition, Génome Québec coordinates access to the population-based longitudinal cohort of CARTaGENE, and to the clinical cohorts of the Genizon Biobank, the Canadian Centre for Computational Genomics (C3G), the Canadian Data Integration Centre (CDIC) and the Centre for Advanced Proteomics Analyses (CAPA).

Highlights of the year

The Génome Québec and McGill University Innovation Centre technology pool was enhanced by the arrival of a fleet of five new HiSeq X sequencers and one HiSeq 4000 sequencer. This addition was made possible by funding awarded to Professor Mark Lathrop by the Canadian Foundation for Innovation and will ensure that the Centre remains at the cutting edge of technology. The Centre recorded revenues of $16.8 million, an increase of nearly 4% over last year, indicating that income growth has remained steady since its inauguration in 2002. The number of users is maintained at 900 with high quality operational standards and a 95% user satisfaction rate.

This year the Centre is still well positioned to maintain its competitive edge, both nationally and internationally, and to continue growing.

The Génome Québec and CHAUR Biobank has been awarded a major DNA extraction contract by the five national cohorts of the Canadian Partnership for Tomorrow Project.

The 45,000 clinical samples at the Genizon Biobank have been available to the scientific community since September 2015.

Exome sequencing in children: an attractive option

Spinoffs from the CHU Sainte-Justine and Génome Québec Integrated Pediatric Clinical Genomics Centre include the results of a study the Centre produced on the diagnosis of rare gene disorders in children. The aim of the study was to assess the economic impact of using whole exome sequencing in diagnosing rare disorders in children and to compare this method with standard diagnostic approaches.

The economic assessment revealed that whole exome sequencing as currently practised by the Integrated Pediatric Clinical Genomics Centre is cost-effective and represents an attractive option from the economic standpoint, as it is associated with a higher (more effective), faster, diagnosis rate than the traditional approach based on classical tests, at lower cost. If the conditions for financing and implementation are met, this technology will represent a more clinically effective and economical option than previous approaches to the diagnosis of rare and complex disorders in children.

PUBLIC OUTREACH

This year, Génome Québec celebrated its 15th anniversary and to mark this milestone, several knowledge-sharing activities were organized. With only limited resources at our disposal, we needed to find creative ways to attain our public outreach objectives, now more complex than ever due to the diversification and segmentation of our target audiences. By all accounts, our actions were a resounding success.

A 15th anniversary to honour the talent of our researchers

To celebrate this important milestone we looked back at the evolution of genomics over the last 15 years. A series of activities for our various audiences was organized and a microsite was developed to present the 15-year history of genomics research in Québec. The special microsite was launched during an event hosted by Génome Québec on September 23, 2015, attended by some 100 guests, including government officials, such as Finance Minister Carlos J. Leitão and Chief Scientist of Québec, Rémi Quirion, as well as business partners and researchers.

Concomitant to the event, a special section was published in La Presse+, announcing the winners of the Genome Canada competition Genomics and Feeding the Future. It also featured an editorial highlighting our organization's 15 years and a fun little quiz on genomics research. The Saturday, September 19, 2015 issue garnered a total of 78,747 impressions.

Public education initiatives marked by innovation

Génome Québec organized two Café Scientifique events facilitated by Radio-Canada science journalist Michel Rochon. The first was held on November 11, 2015 at Théâtre Rialto, in collaboration with Amis du Champ des Possibles, and researchers Mohamed Hijri and Michel Labrecque of the Institut de recherche en biologie végétale at Université de Montréal. Some 200 citizens and students gathered for this discussion on bioremediation.

A second Café, hosted in partnership with Association des communicateurs scientifiques, took place in Montréal on March 17, 2016. With the participation of Professor Roger C. Levesque of the Institute for Integrative Systems Biology (IBIS) at Université Laval and Daniel Tessier, Vice President, Technology Centres at Génome Québec, the event presented the major advances in genomics research. It attracted close to 80 people, mostly science journalists and communicators who came out to learn more on the latest breakthroughs in the field. In the following days, an article was published in La Presse+.

From left to right: Rémi Quirion, Martin Godbout, Finance Minister, Carlos Leitão and Marc LePage

Left: Café Scientifique on bioremediation (Mohamed Hijri and Michel Labrecque) Right: Café Scientifique on the major advances in genomics research. (Michel Rochon, Roger C. Levesque and Daniel Tessier)

Above: Panel on the future of innovation in health care (Innover ensemble pour la santé de demain)


LE DEVOIR
LIBRE DE PENSER

Quand la chimiothérapie tue

Un plaidoyer pour une médecine personnalisée donnant plus de place à la génétique

3 décembre 2015 | Isabelle Porter à Québec | Santé

Photo: iStock

En février 2011, le mari de Colette Bibeau est décédé dans de grandes souffrances après avoir subi un traitement de chimiothérapie au Xeloda. Elle milite désormais pour que les médecins tiennent compte du profil génétique des patients dans leur travail. Mais est-ce réaliste, et si oui, pour quand ?

In addition, a panel on the future of innovation in health care (Innover ensemble pour la santé de demain) was organized with BIOQuébec as part of the Québec City Healthcare Industry Forum. Held on December 2, 2015, the activity was an unprecedented success, attracting significant media coverage, including a front page article in Le Devoir and a radio interview with Health Minister Gaétan Barrette.

Finally, in collaboration with educators of the Laval and Seigneurie-des-Mille-Îles school boards, our team developed a learning situation. This mini-lab gave Secondary 3 and 4 students the opportunity to use a scientific investigation approach while manipulating DNA. Launched in January 2016, the mini-lab was reserved by five high schools and booked to capacity for the entire semester. If this upward trend continues, we hope to be able to offer the pilot project to other school boards.

2462 followers | 1373 followers | 1184 | 4,5% increase in page views

FINANCIAL ACTIVITY REPORT

Génome Québec receives most of its financial support from the Québec government and Genome Canada for the funding of research projects and the operation of its technology centres.

As of March 31, 2016, our research portfolio included 39 genomics projects, and three technology centres are currently in operation. Génome Québec invested $55.5 million during the 2015-2016 fiscal year. This amount, combined with the $30.5 million invested by other partners, brings our overall injection of funds to $86 million, an amount equal to last year.

Business volume generated by research projects during the fiscal year amounted to $64.7 million. This year, Génome Québec managed projects in many competitions, the largest being Personalized Health, the Fonds de partenariat pour un Québec innovant et en santé and the new Genomics and Feeding the Future competition. The budget for projects underway totals $286 million, $81 million of which is still to be carried out.

For the year ended on March 31, 2016, sales from our technology centres totalled $17.2 million, up 4% compared to last year. The technology centres posted a deficiency of revenue over expenses of $555,000. This gap is due primarily to funding cuts to the McGill University and Génome Québec Innovation Centre and the rise of the US dollar.

General and administrative expenses, communications and outreach costs and committee expenses totalled $3.4 million this year, an amount similar to last year, and represents 4.2% of total investments for the year.

These activities include the development of genomics sectors, corporate management and governance, economic and strategic studies and human resources management. Investment revenue reached $166,629, for a return of 1.18%.

The insufficiency of revenue over expenses totalled $1,258,042 due to the shortage of revenue of the technology centres and activities of Génome Québec resulting from lack of government funding. Non-designated net assets were down by $277,000, reaching a total of $2.1 million on March 31, 2016. Net assets dedicated to activities decreased by $944,000 during the fiscal year and now total $220,000. Net assets totalling $500,000 have once again been earmarked for the contingency and technological development funds.

Finally, Génome Québec has respected the terms and conditions in compliance with the contractual agreements it has signed with its major financial partners.

MARTIN GODBOUT
Executive Chairman
Génome Québec

CLAUDE LAMARRE
Vice President, Finance
Génome Québec

FINANCIAL STATEMENTS

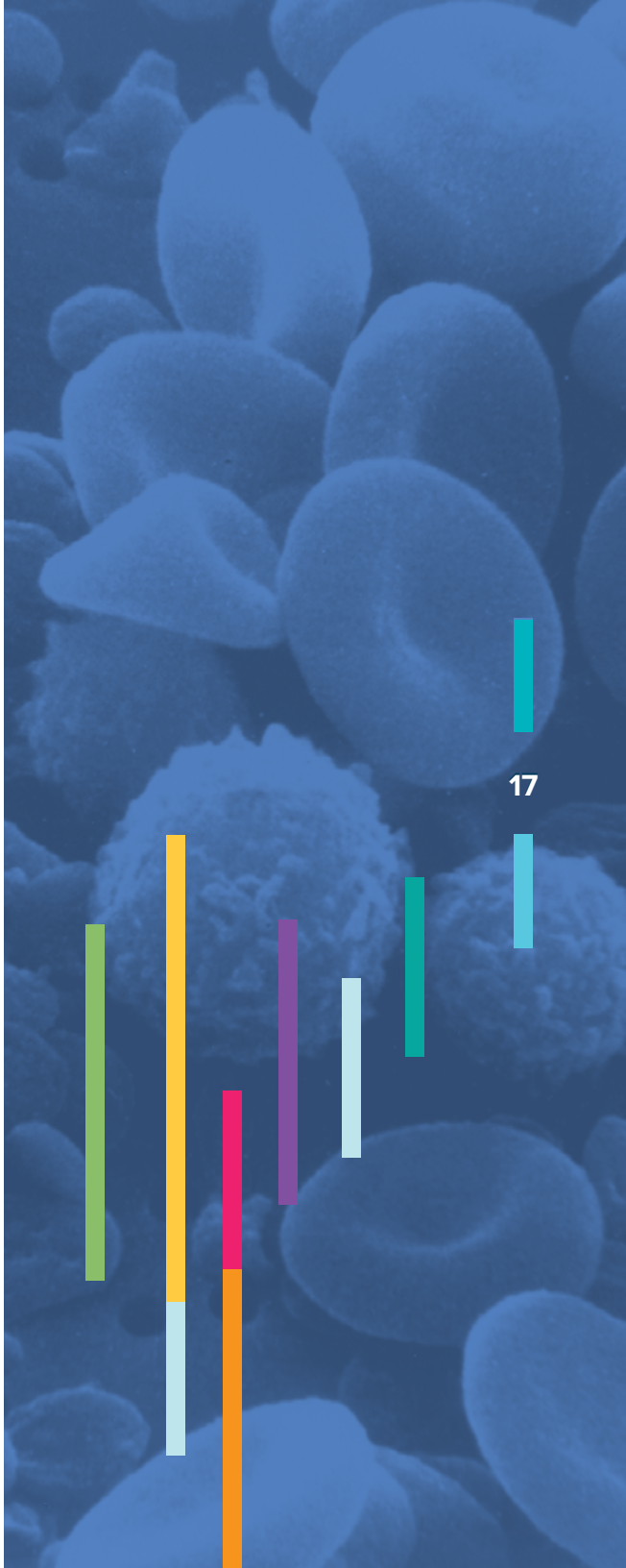
Statements of Financial Position - March 31, 2016 with comparative information for 2015

The Statements of Financial Position as at March 31, 2016 and 2015 and the Statement of Operations for the years ended March 31, 2016 and 2015 that follow are provided as illustrative summaries only and are not intended to replace the full financial statements of Génome Québec. These full financial statements, available in French only, were audited and reported on June 21, 2016 by KPMG LLP, Chartered Professional Accountants.

	2016	2015
ASSET		
CURRENT ASSETS		
Cash and cash equivalents	$ 703,969	3 150,768
Short- term investments	5,134,021	18,335,864
Contributions receivable	3,841,417	–
Accounts receivable and work in progress	2,116,882	2,901,065
Advances to genomics research projects	5,781,786	4,444,407
Inventories	2,121,909	1,749,723
Prepaid expenses	145,611	201,744
	19,845,595	**30,783,571**
Long-term investments	3,264,946	3,306,085
Capital assets	532,541	644,174
	23,643,082	**34,733,830**
LIABILITIES AND NET ASSETS		
CURRENT LIABILITIES		
Accounts payable and accrued liabilities	5,930,343	4,130,914
Deferred revenues	334,384	427,083
Obligations related to an agreement	–	2,897,793
	6,264,727	**7,455,790**
DEFERRED CONTRIBUTIONS		
Future expenses	14,053,739	22,620,309
Capital assets	492,499	567,572
	14,546,238	**23,187,881**
	20,810,965	**30,643,671**
NET ASSETS		
Unrestricted	2,071,583	2,348,823
Restricted – Invested in capital assets	40,042	76,602
Restricted – Technology investment and contingency fund	500,000	500,000
Restricted – Research Projects	220,492	1,164,734
	$ 23,643,082	**$ 34,733,830**

STATEMENT OF OPERATIONS - Years ended March 31, 2016 and 2015

	2016	2015
REVENUES		
Amortization of deferred contributions related to expenses	$ 40,423,630	$ 44,150,059
Amortization of deferred contributions related to capital assets	219,418	217,735
Investment income	166,629	352,254
Revenues from technology centres	17,212,977	16,501,635
Other revenues	645,621	713,116
	58,668,275	**61,934,799**
EXPENSES		
Genomics research projects	21,770,354	24,341,632
Research projects, Québec Innovant et en Santé	12,501,215	11,846,340
Technology centres operational costs	21,950,950	20,829,683
Projects – Technology investment and contingency fund	–	640,000
General and administrative	2,955,797	2,765,912
General and administrative, Québec Innovant et en Santé	131,050	314,037
Communications and public outreach	300,919	368,691
Committees	60,054	26,810
Depreciation of capital assets	219,418	217,735
Depreciation of restricted capital assets	36,560	62,194
	59,926,317	**61,413,034**
(Insufficiency) Excess of revenues over expenses	**$ (1,258,042)**	**$ 521,765**



BOARD OF DIRECTORS, COMMITTEES AND EMPLOYEES

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LARGE-SCALE PROJECT OUTCOMES

March 2016

	Number of persons employed in the 4th Quarter 2015-2016	Number of scientists trained in the 4th Quarter 2015-2016	Number of publications accepted or submitted	Number of conferences as speaker	Number of declarations of invention or patents	Project starting date
2012 COMPETITION - LARGE-SCALE APPLIED RESEARCH PROJECTS / PERSONALIZED HEALTH						
Claude Perreault - HMR • Immunotherapy *(Cancer)*	18,5	1	2	2	1	April 2013
Patrick Cossette - CHUM • Eplilepsy	9,7	1	0	1	0	April 2013
Guy Sauvageau - UMontréal • Leucégène GC *(Acute Myeloid Leukemia)*	39,8	3	10	8	3	April 2013
François Rousseau - ULaval • PEGASUS *(Prenatal aneuploidy screening using maternal blood)*	46,4	13	12	14	0	April 2013
Jacques Simard - ULaval • Breast cancer *(Prevention and early detection)*	21,7	6	10	18	0	April 2013
John Rioux - MHI • iGenomed *(Inflammatory bowel diseases)*	26,2	2	0	8	0	April 2013
Jean-Claude Tardif - MHI • Cardiovascular disease *(Targeted therapeutics)*	16,6	3	5	3	0	April 2013
Nada Jabado - Research Institute of the MUHC • iChange *(Pediatric brain cancer)*	20,7	10	9	9	0	April 2013
Sin - UBritish Columbia / MacNamara, Bourbeau - McGill / Awadalla - UMontréal / Maltais - ULaval • COPD *(Disease management)*	1,5	0	1	7	2	April 2013
Harrigan - UBritish Columbia / Charest, Tremblay - INSPQ / Roger - UMontréal / Wainberg - McGill • AIDS *(Response to therapies)*	0,5	0	5	11	0	April 2013
McCabe - UAlberta / Gold, Kimmelman - McGill • PACE-'Omics *(GE3LS, adoption of personalized medicine)*	1,3	0	13	40	0	April 2013
Boycott - UOttawa / Brais, Knoppers, Majewski - McGill / Michaud, Samuels - UMontréal • CARE for RARE *(Rare Genetic Diseases in Canada)*	2,8	0	8	6	0	April 2013
TOTAL	**205,6**	**39**	**75**	**127**	**6**	
2012 COMPETITION - BIOINFORMATICS AND COMPUTATIONAL BIOLOGY						
Jérome Waldispuhl - McGill • Science games in genomics	9,5	7	2	3	0	July 2013
Mathieu Blanchette - McGill • PIATEA	4,9	2	2	1	0	July 2013
Anne-Claude Gingras - Samuel Lunenfeld Research Institute / Mike Tyers - UMontréal • ProHits next Generation	2	0	5	5	0	July 2013
TOTAL	**16,4**	**9**	**9**	**9**	**0**	

RECRUITMENT COMPETITIONS						
CARTAGENE DIRECTOR						
Philip Awadalla - CHU Ste-Justine • CARTaGENE	Completed	Completed	52	51	0	January 2010
HUMAN HEALTH						
Mike Tyers - UMontréal • Biological network in human health	25	13	7	11	1	April 2011
Mark Lathrop - McGill • Medical genomics	18	1	3	1	0	April 2011
TOTAL	**43**	**14**	**62**	**63**	**1**	

GENOMIC APPLICATION PARTNERSHIP PROGRAM (GAPP)						
Steve Labrie- ULaval • Metagenomics and cheesemaking technologies	2,4	0	0	0	0	April 2014
Adrian Tsang - UConcordia • Enzime supplement for swine and poultry	17,3	0	0	0	0	October 2014
Hamelin - UBritish Columbia /Roger C. Levesque - ULaval- IBIS • Next generation biosurveillance of invasive alien species	3,8	0	0	3	0	October 2014
Jean Bousquet - ULaval • FastTRAC *(Fast tests for rating and amelioration of conifers)*	14,0	1	7	13	0	April 2015
Michel Bergeron - CHU de Québec • New test to rapidly diagnose infections	4,6	0	0	0	0	October 2015
TOTAL	**42,1**	**1**	**7**	**16**	**0**	

COMPETITION - FONDS DE PARTENARIAT POUR UN QUÉBEC INNOVANT ET EN SANTÉ						
Gerald Batist - JGH • Personalized health care network Q-CROC	33,7	1	0	32	0	April 2014
Michel Bergeron - CHU de Québec • Rapid molecular Diagnostics *(C Diff, BMDR)*	21	1	1	0	0	April 2014
Michel Bouvier - IRIC (IRIC-Industry) Drug discovery	73,6	10	4	25	6	April 2014
Nicola Hagemeister - ÉTS • Arthritis of the knee *(Diagnostic and treatment)*	8,7	1	0	0	0	October 2014
Pavel Hamet - CHUM • OPTI-THERA - Optimization of the therapeutics approaches in primary care	38,4	9	10	17	0	April 2014
Jean-Claude Tardif- ICM • ARTERIA- Cardiovascular personalized diagnostics and therapies	42,7	0	2	7	0	April 2014
Brian Ward- CUSM • Vaccines produced in plant against viral pneumonia	25,8	8	20	14	0	April 2014
TOTAL	**243,9**	**30**	**37**	**95**	**6**	

COMPETITION - GENOMICS INNOVATION NETWORK (GIN)						
CORE OPERATION SUPPORT						
Philip Awadalla - CHU Ste-Justine • Canadian Data Integration Centre *(CDIC)*	6,3	0	8	28	0	April 2015
Guillaume Bourque - McGill • Canadian Centre for Computational Genomics *(C3G)*	16,9	0	9	39	0	April 2015
Mark Lathrop - McGill • Génome Québec and McGill University Innovation Centre	59,1	0	0	2	0	April 2015
Pierre Thibault - IRIC • Centre for Advanced Proteomic Analyses *(CAPA)*	7,3	0	15	21	0	April 2015
TECHNOLOGY DEVELOPMENT						
Guillaume Bourque - McGill • Canadian Centre for Computational Genomics *(C3G)*	2,5	0	0	0	0	October 2015
Mark Lathrop - McGill • Génome Québec and McGill University Innovation Centre	13,6	0	0	0	0	October 2015
TOTAL	**105,7**	**0**	**32**	**90**	**0**	
GLOBAL ALLIANCE						
Bartha Knoppers - P3G • Canadian international data sharing initiative to accelerate health care innovation *(Can-SHARE)*	12,2	12	6	5	0	June 2015
TOTAL	**12,22**	**12**	**6**	**5**	**0**	
COMPETITION - GENOMICS AND FEEDING THE FUTURE						
François Belzile - ULaval • Improving yield and disease resistance in short-season soybean *(SoyaGen)*	20,9	6	0	5	0	October 2015
Lawrence Goodridge - McGill/Roger C. Levesque - ULaval-IBIS • Ensure food safety and reduce the economic burden of salmonellosis	15,9	2	0	3	0	October 2015
Foster - UBritish Columbia /Nicolas Derome - ULaval • Sustaining and securing Canada's honey bees using 'omic tools	0	0	0	1	0	October 2015
Davidson - UBritish Columbia /Louis Bernatchez - Ulaval • Enhancing production in Coho: Culture, Community, Catch *(EPIC4)*	5,7	0	0	3	0	October 2015
TOTAL	**42,5**	**8**	**0**	**12**	**0**	
TOTAL ONGOING PROJECTS	**711,4**	**113**	**228**	**417**	**13**	

ASSESSMENT OF COMPLETED PROJECTS

March 2016

	Number of persons employed in year-person	Number of researchers trained in year-person	Number of publications accepted or submitted	Number of conferences as speaker	Number of declarations of invention or patents	Duration of the project
ABC COMPETITION						
Thomas Bureau - McGill • VEGI *(Crop improvement)*	58	11	22	54	3	5 years
Adrian Tsang - UConcordia • Genozymes *(Bioproducts and bioprocesses development)*	314,3	35	52	37	13	5 years
Peter Facchini - UAlberta/Vincent Martin - UConcordia • Phytometasyn *(Synthetic biosystems for the production of high value plant metabolites)*	38,7	0	44	74	27	5 years
Richard Gold - McGill • Valgen *(Value addition through genomics)*	11	0	50	145	0	5 years
2010 COMPETITION - LARGE-SCALE APPLIED RESEARCH PROJECTS						
John MacKay - ULaval /Jörg Bohlman-UBritish Columbia • SMarTForest *(Sustainable forestry)*	165,8	37,5	68	115	0	4 years
B. Franz Lang/Mohamed Hijri - UMontréal • GenoRem *(Decontaminating soils)*	154,2	55,1	25	84	0	4 years
ENTREPRENEURSHIP PROGRAM - EDUCATION IN GENOMICS						
Denis J. Garand - ULaval • BEST in Genomics! *(Optimize transfer of knowledge)*	14,1	2,3	0	17	0	3 years
GQ HEALTH COMPETITION						
Gregor Andelfinger - CHU Ste-Justine • Congenital heart disease	9,7	2,4	2	4	1	4 years
Guy A. Rouleau - CHUM • Bipolar disorders	12,9	0,2	5	5	0	3 years
Guy Sauvageau - IRIC • Acute myeloid leukemia	28	2,2	7	9	5	3 years
John H. White - McGill • Tuberculosis	15,8	6,7	5	14	0	3 years
Ken Dewar - McGill • Digestive problems	18,1	5,8	3	9	0	3 years
Mark Basik - Lady Davis Institute • Breast cancer	36,1	10,5	7	20	0	4,5 years
Michael Hallet - McGill • Breast cancer	22,3	5	5	5	0	4 years
Alain Moreau - CHU Ste-Justine • Diagnostic tools for pediatric scoliosis	26,6	11,8	4	3	0	4 years

Michel G. Bergeron - ULaval • Rapid diagnostic tests	12	1	0	8	1	2 years
Maryam Tabrizian - McGill • Portative biosensors	17,7	6,7	15	19	0	4 years
Paul Goodyer - CUSM • Cell therapy of cystinosis	18,1	7,1	1	10	0	3 years
Pavel Hamet - CHUM • Type 2 diabetes	27,4	5,7	0	22	6	3,5 years
Gordon Shore/Michel L. Tremblay - McGill • Cancer therapy	18,3	2,7	0	6	1	3,5 years
COMPETITION - QUÉBEC VERT						
François Belzile - ULaval • GreenSNPs *(Environmental genomics)*	5,6	2	4	9	0	2 years
Connie Lovejoy - ULaval • CATG *(Genomics for Arctic environment)*	4,2	1,2	0	3	0	1,5 year
Vincent Martin - UConcordia • PAYGE *(Reducing fuel dependency)*	2,6	0	0	0	0	2 years
GQ PILOT PROJECTS COMPETITION						
Jamie Engert - CUSM • Heart disease	3	0	0	0	0	2 years
Julie St-Pierre - McGill • Breast cancer	4,4	1	1	1	0	2 years
Pierre Drapeau/Edor Kabashi - UMontréal • Amyotrophic lateral sclerosis therapeutics	9,8	6	3	12	1	2 years
Roger C. Levesque - ULaval • Budworm ecogenomics	8,5	2	3	15	0	2 years
Sarah Kimmins - McGill • Infertility	5,6	3,1	2	9	0	2 years
Zoha Kibar - CHU Ste-Justine • Neural tube defects	4,8	0	0	0	0	2 years
COMPETITIONS I AND II, HEALTH						
Michel G. Bergeron - CHU de Québec • Theranostics technologies *(Diagnostic tests to identify microbes causing infections)*	118	25	25	58	11	3,25 years
Deming Xu - Privé • Chemogenomics *(New treatments for life-threatening fungal infections)*	101	2	8	4	1	3 years
Thomas J. Hudson - McGill • ARCTIC *(Colorectal cancer)*	42	6	19	15	9	3,25 years
Franz Lang - UMontréal • PEP Québec *(Evolution of eurayotic cells and corresponding genes)*	49	21	20	18	0	3,5 years
Bussey/Michnick - McGill • Model organisms *(Genetic interaction in eukaryotic cells)*	20	4	18	55	0	4 years
John J.M. Bergeron - McGill • Proteomics *(Runction and structure of genes and proteins)*	174	67	42	125	7	4 years
Fernand Labrie - ULaval • Atlas *(Profiles of steroid action)*	347	120	49	29	2	5 years

Bartha Maria Knoppers - McGill • GE3LS *(Genomics and society)*	38	20	83	153	0	4 years
Fathey Sarhan - UQÀM - Abiotic Stress Québec *(Improve agricultural productivity)*	82	28	11	17	0	4 years
Thomas J. Hudson - McGill • Regulatory genetics *(Identification of regulatory polymorphisms in the human genome)*	117	27	16	51	6	4 years
Rafick-Pierre Sékaly - UMontréal • S2K *(Immune response)*	194	79	17	150	6	4 years
Mario Fillion - McGill • IGWH *(Womens' health)*	36	5	1	10	4	3 years
Sherif Abou Elela - USherbrooke • MoNa *(Genome wide analysis of gene function)*	51	8	6	9	2	3 years
Adrian Tsang - UConcordia • Fungal enzymes *(Environmental remediation)*	167	69	16	22	8	3 years
Benoit Coulombe - UMontréal • Regulatory networks *(Decode genetic information)*	189	63	15	111	0	3,5 years
John MacKay - ULaval • Arborea I *(Health of trees)*	98	31	23	63	2	3,5 years
Thomas J. Hudson - McGill • HapMap *(Genetic research)*	34	2	14	87	1	3 years
Emil Skamene - McGill • Congenic mice *(Direct complex traits relevant to human health)*	60	13	2	11	3	4,25 years
Guy Rouleau - UMontréal • Ionic channels *(Hereditary neurological disorder)*	40	5	0	16	3	4,25 years
Terry Roemer - Private • Candida albicans *(Antifungal drug discovery)*	51	0	2	3	3	3 years
Barry Posner/Rob Sladek - McGill • Type 2 diabetes	91	23	25	35	6	5,5 years
Bartha Maria Knoppers - McGill • GPH *(Genomics and public health)*	5	4	22	47	0	3 years

COMPETITION III, INTERNATIONAL CONSORTIUM INITIATIVE, PRIVAC, TECHNOLOGY DEVELOPMENT

Sherif Abou Elela - USherbrooke • FAESI *(Alternative splicing)*	101,5	10,8	11	28	3	5,25 years
Ken Dewar - McGill • Vervet monkey *(Neuro-development and neurological deterioration)*	18,3	2	3	4	0	4,75 years
Tomi M. Pastinen - McGill • GRID *(Genes regulators)*	213	51,5	84	42	2	4,5 years
Guy A. Rouleau - UMontréal • S2D *(Brain diseases)*	86	12	14	41	1	5 years
Jean-Claude Tardif - ICM • Pharmacogenomics *(Cardiovascular disease)*	346	41	15	87	0	4 years
John MacKay - ULaval • Arborea II *(Improve productivity of forests products)*	186	66,6	49	95	0	5 years
Bartha Maria Knoppers/Thomas J. Hudson - McGill • P3G/CaG *(Population genomics)*	33,5	57	35	54	0	3 years

Daniel Lamarre/Sylvain Meloche - IRIC • RNA platform *(New targeted therapies for cancer)*	16,8	0	0	3	0	2 years
Rafick-Pierre Sékaly - UMontréal • NIML platform *(Vaccines and immunotherapies)*	18	3	4	5	2	2 years
Michel G. Bergeron - CHU de Québec • GPOCT *(Infectiology)*	45	2	9	18	1	2,25 years
Michael Phillips/Jean-Claude Tardif - ICM • Via-PGX *(Cardiovascular pharmacogenomics)*	17,5	3,6	4	44	0	2,5 years
Maryam Tabrizian - McGill • DevTab *(Biomarkers discovery and validation)*	35,3	15,2	34	13	0	2 years
Rafick-Pierre Sékaly/Ryan Brinkman - UMontréal -BCCA • DevSek *(Immune system)*	6	1	2	4	0	2 years
TOTAL COMPLETED PROJECTS	**4 294,5**	**1 112**	**1 026**	**2 236**	**141**	

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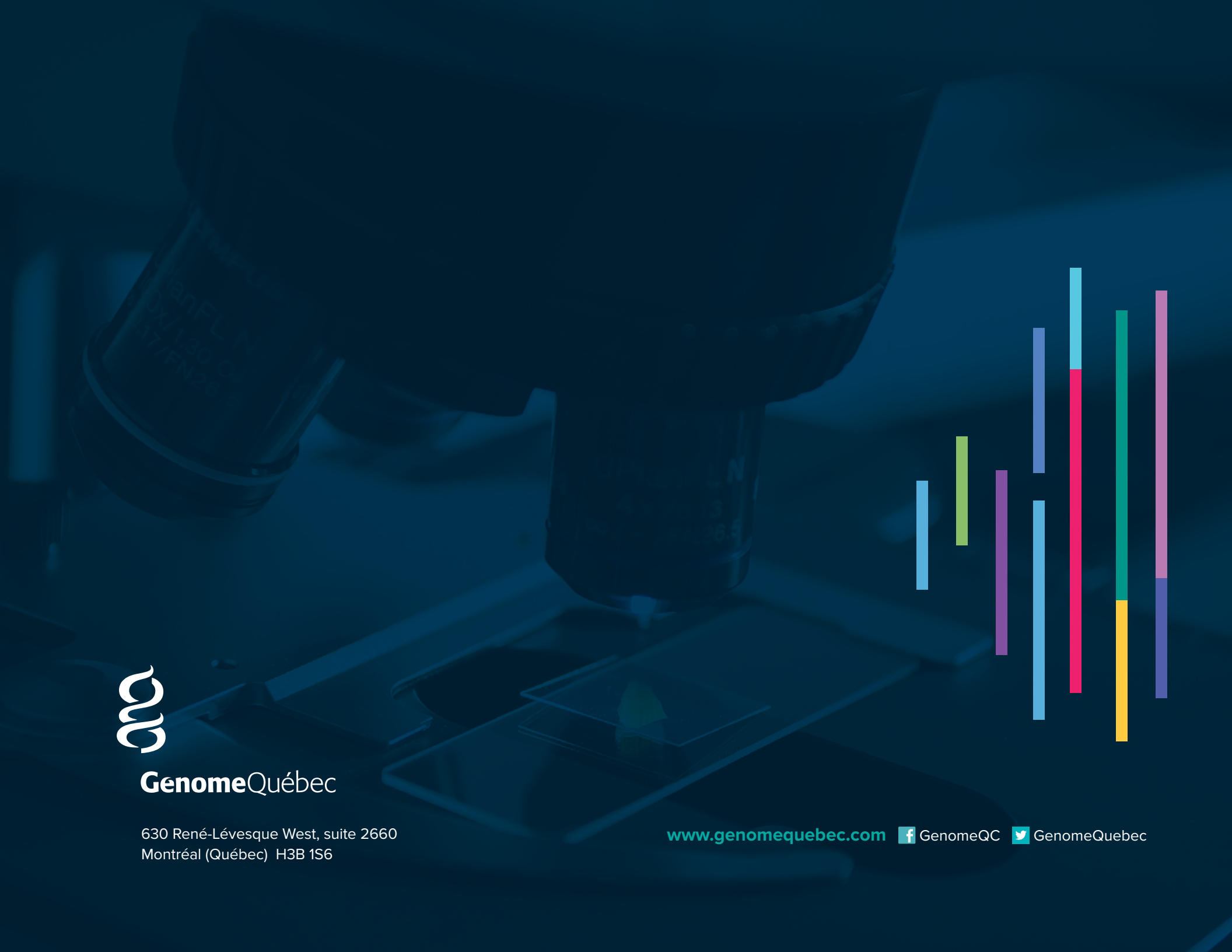

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