GenomeQuébec

Annual Report 2021-2022

The proud trusted and credible resource in genomics for over 21 years

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DID YOU KNOW?

THREE LETTERS TO MAKE EVERYTHING POSSIBLE: DNA

Genomics refers to the study of the complete set of genetic information of all living beings, encoded in their DNA and other similar molecules, such as RNA and proteins. Our current technological capacity to read this "code" of life is unprecedented and continues to develop at a rapid pace. The knowledge gained through genomics holds the key to innovative solutions in a wide range of sectors and offers tremendous opportunities for economic growth and better quality of life for people the world over.

GÉNOME QUÉBEC

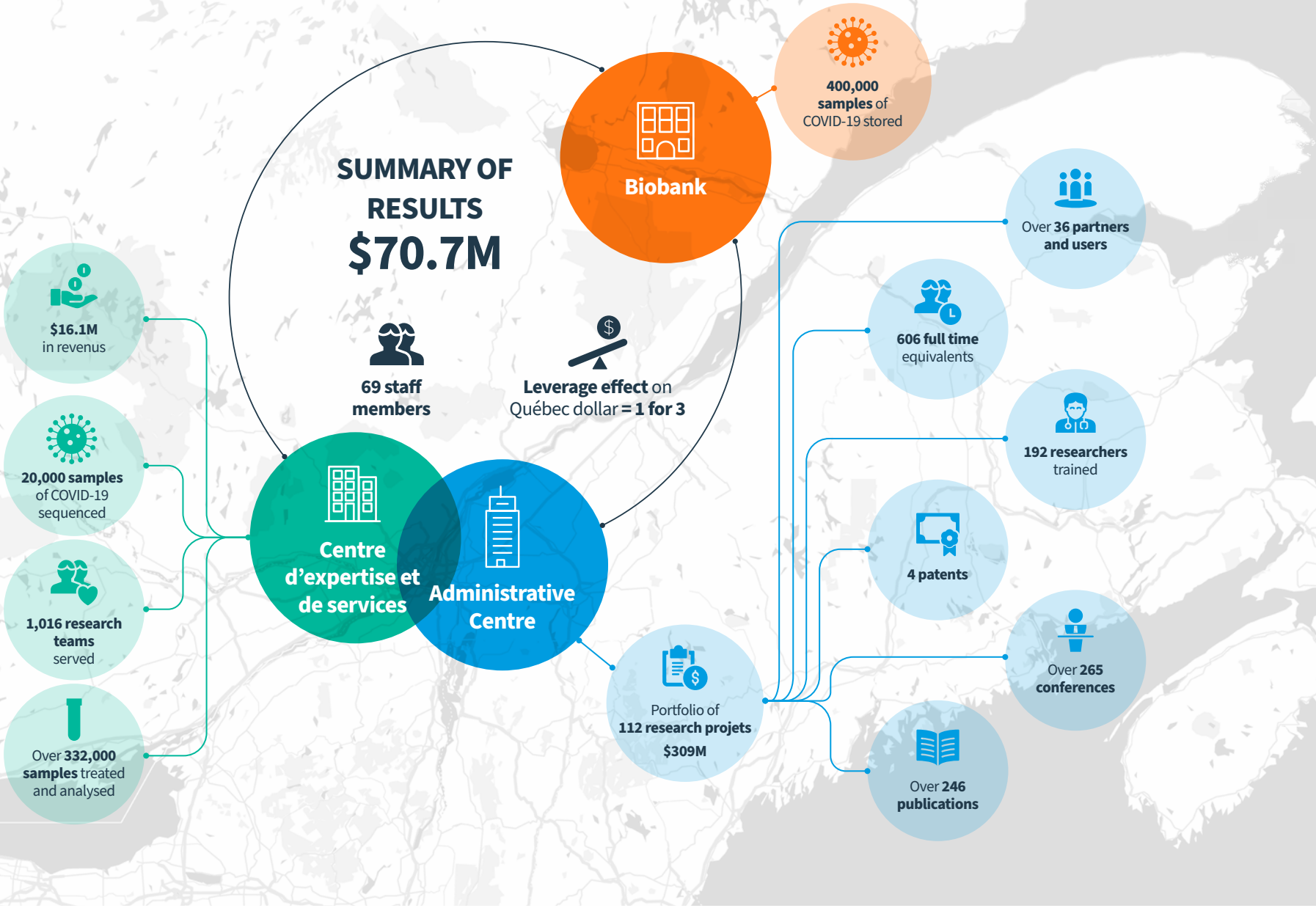
Since its inception in 2000, Génome Québec has helped Québec make great strides in genomics research. Over the years, many areas of activities have benefited from research funded by Génome Québec and its Centre d'expertise et de services (CES) located at CHU Sainte-Justine. Genomics is now seen as a promising technology for the economy, more specifically in health, agrifood, forestry and the environment.

Génome Québec plays a leading role in genomics research by funding the most relevant research and guiding researchers to achieve world-class expertise.

Québec has every reason to be proud of the success of our genomics researchers, who are recognized internationally for the quality of their work and for the major discoveries made right here at home.

Over the past 21 years, more than $1 billion has been invested in genomics through Génome Québec. This includes investments from the provincial and federal governments, as well as other partners.

SUMMARY OF RESULTS



OUR MISSION

Génome Québec's mission is to catalyze the development and excellence of genomics research and promote its integration and democratization. It is a pillar of the Québec bioeconomy and contributes to Québec's influence and its social and sustainable development.

OUR VISION

Genomics-driven innovations improve health care service delivery, support agrifood, environmental and forest management practices and enhance public policies.

OUR VALUES

Excellence

—

Openness

—

Creativity

—

Integrity

—

Ethics

MESSAGE FROM THE CHAIR OF THE BOARD

ANIE PERRAULT

"Québec can take pride in the progress made by Génome Québec, which has been supporting the development of a game-changing disruptive technology for over 21 years."

A STRONG VISION AND DEEPLY ROOTED VALUES WE CAN CONTINUE TO BUILD ON

Though these last two years in the midst of a pandemic have been full of challenges, they have also been brimming with achievements. These last few years have been a turning point for the value of genomics in the eyes of decision makers, influencers and other stakeholders in Québec's social and economic ecosystem. The evidence is in; genomics is essential in many respects, whether it is sequencing viruses, better understanding them to adapt our response, making our health care system more efficient or tackling challenges in climate change, sustainable development or agriculture.

Génome Québec is respected and recognized for its scientific excellence, its rigorous rules of governance and its vision for the strategic development and positioning of genomics in Québec. This is in addition to its leadership in education and civic engagement. Québec can take pride in the progress and the achievements made over the years by this organization dedicated to the development of a disruptive technology that is nothing short of revolutionary.

This success is the result of many contributions, and I would like to take the opportunity to acknowledge here the exceptional contribution of our President and CEO, Daniel Coderre, who has made a profound, unanimous and unprecedented difference at the helm of Génome Québec in the last six years. He will be leaving us in October for a well-deserved retirement, leaving behind a healthy organization enriched by his great experience in politics, science, strategy and governance. I also want to recognize the exceptional human qualities and values instilled by Daniel, which have significantly contributed to mobilizing an entire team to reach for ambitious goals, but especially, to supporting and motivating this team through the storm of the last two years. Daniel's legacy is rich and diverse, and the limited space I have here does not allow me to list it all. So I will limit myself to what I believe made the biggest difference:

- Positioning Génome Québec as a contributor to Québec's socioeconomic development
- Securing and diversifying sources of funding, and fostering closer ties with industry
- Taking advantage of the opportunities created by the pandemic to put genomics to work for government and society, thereby integrating the vision of the ministère de la Santé et des Services sociaux
- Bringing genomics into the clinic by installing the Centre d'expertise et de services's technological resources at the heart of the CHU Sainte-Justine
- Growing Québec's competitiveness in Canada and internationally
- Making education and outreach a priority of the strategic plan
- Making the best use of human resources and assembling a top-notch team
- Establishing various international collaborations

I could break down these accomplishments into many specific deliverables, because our President and CEO excels in getting results. It suffices to read through this annual report to see just how much this great team has been able to accomplish under the leadership of a captain who has been able to keep us on course and impart values and a vision that will remain well anchored in the future.

I feel very privileged to chair Génome Québec's Board of Directors, and it would not have been possible without the invaluable contributions of the board members, whom I want to thank for their availability and their sound guidance. I thank our President and CEO, as well as his entire team, for their dedication to genomics and to Québec.

MESSAGE FROM THE PRESIDENT AND CEO

DANIEL CODERRE

“We have been very pleased to see genomics make its way into government strategies. The future of genomics is very promising.”

A VERY BRIGHT FUTURE FOR GENOMICS

The last fiscal year has been successful for Génome Québec from a professional perspective, but also difficult for its staff because of the impacts of the COVID-19 pandemic. I am proud that they have been able to remain productive and committed: we were able to meet almost all of the 2021–2022 corporate goals set by the Board of Directors and even surpass 40% of them.

There’s no doubt that this would not have been possible without the outstanding contributions of the management team, which has been able to guide staff members with care and to keep them engaged during the more difficult times. I want to take this opportunity to welcome Patrick Blondin, our new Vice President, Technology Centres. Our organization can count on a stable, efficient and complementary senior management team.

What a pleasure to point out that once again this year, Génome Québec has made so many promising achievements. Many important advances were made in research support, deployment of our service, education and social acceptance platforms, management optimization, and mobilization of personnel, and are presented in this annual report.

Among other things, we have continued and significantly strengthened our efforts to combat COVID-19, and established a lasting partnership with Québec’s public health authorities. We have increased our efforts to test for the virus and played an important role in Québec’s variant monitoring program. Despite this extra workload, the Centre d’expertise et de services team has seen a 15% increase in clients and has continued sequencing samples from the CARTaGENE cohort to create a reference genome that is representative of the population of Québec: GenoRef-Q. This initiative is particularly important to me because, once finished, it will provide clear clinical and economic benefits for Québec.

Genomics research has been in full swing this year, with the launch of 29 new projects and a total portfolio of 112 research projects. Thanks to the work of the Scientific Affairs team and the quality of the projects submitted, Québec secured $25M of the funding available across Canada under the *Genomic Applications Partnership Program,* representing 51.25% of the Canadian envelope.

Despite public health restrictions, the Strategic Development and Public Affairs team continued its important work in awareness, mobilization and education. Génome Québec distinguished itself in governmental consultations and was able to position itself well to face important issues, like the launch of innovation zones and access to health data. Our efforts are paying off; we have succeeded in making genomics known as a key disruptive technology for Québec, and we have watched with great enthusiasm and confidence as genomics has made its way into the *Plan pour mettre en œuvre les changements nécessaires en santé*, the *Stratégie québécoise de la recherche et de l’innovation* and the *Stratégie québécoise des sciences de la vie.*

I would like to thank the Québec government and especially the ministère de l’Économie et de l’Innovation, for its unwavering support over the last 21 years. Its financial support of $400M has generated investments of more than $1B, and today, the time has come to take advantage of these assets to help make Québec a more prosperous, resilient and inclusive society.

In closing, I would also like to thank the members of the Board of Directors for their support and their confidence over the last year, as well as all the members of the Génome Québec team, who help maintain such a high standard of excellence in all areas of our organization’s activities.

HIGHLIGHTS

HUMAN RESOURCES

- Staff of the Administrative Centre working from home since March 2020
- Staff of technology centres working on site, with sanitary measures, since May 2020

FIGHT AGAINST COVID-19

- Creation of the Canadian COVID-19 Genomics Network
- Announcement from the Biobanque québécoise de la COVID-19 on the release of data made available to research teams
- 20,000 positive samples sequenced at the CES under the COVID-19 variant monitoring program led by the Laboratoire de santé publique du Québec

SCIENTIFIC AFFAIRS

- Oversight of a portfolio of 112 projects, of which 29 began this year
- Partnership with the FRQNT valued at $2.6M to support innovation in the context of economic recovery in the bio-food and environment sectors
- Funding of 13 projects under the *Genomics Integration Program – Human Health,* for a total investment of $4.86M
- Nearly $25M made available to Québec research teams under the Genomic Applications Partnership Program, 51.25% of the Canadian envelope

BUDGET

- Investments of $70.7M
- General and administrative costs of 3,81%
- Significant resumption of activities

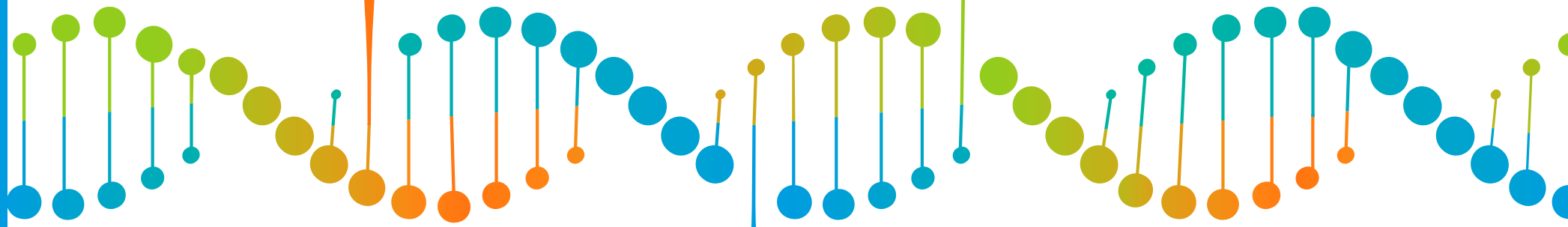
HIGHLIGHTS

EDUCATION AND SOCIAL ACCEPTANCE

- Publication of the Enseignement de la génétique au secondaire : revue systématique d'une décennie de recherches empiriques en science de l'éducation (2009–2019) report, in partnership with the Équipe de recherche en éducation scientifique et technologique de l'Université du Québec à Montréal, led by professor Pierre Chastenay

TECHNOLOGY CENTRES

- 1,016 research teams served, representing an increase of more than 15% compared to last year
- 900 of 2,000 samples sequenced under the GenoRef-Q initiative
- A second NovaSeq sequencer acquired
- Revenues of $17.3M, representing a 44% increase compared to the last fiscal year



PUBLIC AFFAIRS

- Genomics referenced in the *Plan pour mettre en oeuvre les changements nécessaires en santé* from the Québec government
- Two briefs submitted
  - *Stratégie québécoise de la recherche et de l'innovation*
  - *Consultations prébudgétaires*
- Restructuring of the Strategic Development and Public Affairs team's organizational matrix

SCIENTIFIC OUTREACH

STÉPHANIE LORD-FONTAINE
Vice President, Scientific Affairs

« The implementation of two new genomics integration programs has enabled us to attract 35 new partners, including several Québec start-ups and SMEs. This speaks to genomics' maturity and to its potential to generate concrete economic benefits. »

GENOMICS AS A DRIVER FOR SOLUTIONS AND INNOVATION

The year 2021–2022 has been brimming with achievements for the Scientific Affairs team. We have launched many health care, agriculture and environment initiatives, funding programs and projects, all while continuing our efforts in the fight against COVID-19. Genomics has never been more relevant than in today's pandemic context, and consistency and resilience have been key assets in the implementation of our scientific competitions and partnerships. The team has continued to oversee a portfolio of 112 projects, of which 29 began during the last fiscal year.

PARTNERSHIP PROGRAM: BENEFITS FOR BOTH PUBLIC AND PRIVATE USERS

Génome Québec has continued its efforts this year to create new collaborative research partnerships between the genomics scientific community and public and private users, through its new *Genomics Integration Program* (Human Health, Agriculture and biofood, forestry and environment).

This program has attracted 35 new user partners, including many Québec start-ups and SMEs, out of a total of 45 submitted applications. This speaks to genomics' maturity and to its potential to provide concrete solutions for the government and for the private sector.

In October 2021, Génome Québec, in collaboration with the Fonds de recherche du Québec – Nature et technologies (FRQNT), launched the first cycle of the *Genomics Integration Program – Agriculture and biofood, forestry and environment.* This partnership, valued at $2.6M, $600,000 of which comes from the FRQNT, will not only stimulate the implementation of our mutual strategies, but also be a catalyst for Québec research in these promising areas. The program will facilitate the development of a proof of concept to support the competitiveness of research teams in sectors closely linked to the development of Québec's economy and innovation.

In June 2021, Génome Québec also announced the results of the first cycle of the *Genomics Integration Program – Human Health.* Thirteen research teams, representing four Québec universities, were awarded genomics funding. Génome Québec sincerely thanks Oncopole for its participation in this project through a contribution of $200,000 for the joint funding of five cancer research projects. The total investment for these 13 projects is $4.86M, of which $2.8M comes from partners. This program meets a real need in the health innovation community, both for the discovery of new treatments and to accelerate the integration of genomics in the clinic. Québec's cutting-edge expertise in artificial intelligence also plays a central role in the approaches proposed by the funded teams.

Among the projects chosen to receive funding under the *Genomics Integration Program – Human Health*, two stand out in particular for their potential benefits and their creativity.

This year, Yves Brun, full professor at the Faculté de médecine - Département de microbiologie, infectiologie et immunologie de l'Université de Montréal, was awarded $400,000 in funding for his project linking antibiotic resistance to artificial intelligence. A promising combination!

The project, *Antibacterial drug discovery guided by Artificial Intelligence*, in collaboration with Valence Discovery, aims to efficiently develop new and highly efficient antibacterial drugs in order to expand available treatment options.

With rising antibiotic resistance and declining private investment in the development of new antibiotics, the world urgently needs new drugs to fight bacterial infections. Using genomics data on bacteria and cutting-edge artificial intelligence techniques, the project will identify antibacterial drug candidates from among millions of previously untested chemicals, even those never synthesized.

Another recipient of the same program is the *Delivering precision medicine in pediatric hemato-oncology by integrating clinical genomics into the care pathway* project by Dr. Sonia Cellot and Dr. Vincent-Philippe Lavallée, from the CHU Sainte-Justine, which has received $450,000 in funding. By integrating genomics into the care pathway, this project uses precision medicine to better diagnose and treat children with cancer.

Modern sequencing technologies have made it possible to identify the genetic code of pediatric cancers at a very high level of resolution. While working closely with the ministère de la Santé et des Services sociaux, this research project aims to make full use of clinical genomics in the health care system, and especially in oncopediatrics. Integrating genomics into diagnostic clinical labs is critical in ensuring quality patient care, particularly in terms of personalized therapies, in a way that supports the rational use of resources.

But collaborative research excellence in Québec doesn't stop there. In March 2022, under Genome Canada's *Genomic Applications Partnership Program,* almost $25M in funding was announced for genomics in Québec, including $6.7M through Génome Québec. The excellence of the applications submitted allowed Québec's research teams to receive 51.25% of the Canadian envelope. The chosen projects will help in the development of new solutions to face the challenges encountered in the health, agri-food, forestry and environmental sectors. These research and public-private partnership projects demonstrate the broad scope of research into sustainable solutions for Québec's future and its industrial fabric.

GENOMICS SOLUTIONS FOR THE ENVIRONMENT AND CLIMATE CHANGE

Génome Québec continues to support large-scale research projects on the environment. In July 2021, $18.4M was invested to support six innovative projects in Québec. These projects will receive almost $4M in joint funding through Génome Québec, which is managing these in partnership with Genome British Columbia, Genome Alberta and Ontario Genomics. A total of 19 Québec research teams from different universities are collaborating on these projects, which will advance our understanding of biodiversity in Québec and Canada, and allow us to develop bioremediation and plastic waste recycling technologies.

Among these projects is *iTrackDNA*, led by Valérie Langlois, from the Institut national de la recherche scientifique; Caren Helbing, from the University of Victoria; Jérôme Dupras, from the Université du Québec en Outaouais; and Louis Bernatchez, from Université Laval. This project will build user capacity through analytical environmental DNA (eDNA) tools that are innovative, accessible and socially responsible. This pan-Canadian collaborative project, valued at more than $12M, will give governments, First Nations, non-governmental organizations and industrial groups new standards for the use of eDNA. These standards will facilitate sound decision making to support ecological surveys for species at risk monitoring, invasive species management and the granting of permits for the sustainable use of national resources.

GENOMICS, A TRANSATLANTIC TOPIC

In genomics, networking and collaboration build strong and productive scientific relationships. With this in mind, Génome Québec, in collaboration with the Fonds de recherche du Québec – Santé, and the CORIS, organized the Winter School in February 2022. Over five days, about 30 researchers from Québec and Italy were able to discuss five themes: organ regeneration, gene therapy for rare diseases, artificial intelligence in genomics, biobanks and COVID-19.

ACHIEVEMENTS OF THE CANADIAN COVID-19 GENOMICS NETWORK (CanCOGeN)

It has now been a little more than two years since we helped create the Canadian COVID-19 Genomics Network (CanCOGeN), a $40M Genome Canada initiative launched in April 2020 with the goal of producing accessible and usable data on the virus (VirusSeq) and on patients (HostSeq). The information collected by the network has helped inform decisions on policy and public health, and guide the development of treatments and vaccines. We can proudly say that this Canadian network has laid a strong foundation for the adoption of genomics as an essential tool for health crisis management.

As of March 2022, more than 400,000 viruses had been sequenced as part of the VirusSeq project across Canada. In Québec, VirusSeq, led by the Laboratoire de santé publique du Québec (LSPQ), aims to inform public health authorities in their decision making and monitor variants. The LSPQ has collected more than 390,000 viral samples and sequenced 90,427 of them, which is more than double the initial goal and represents almost 22% of the total samples sequenced in Canada.

The Biobanque québécoise de la COVID-19 (BQC19), funded by the Fonds de recherche du Québec – Santé (FRQS), Génome Québec, the Public Health Agency of Canada, and, since March 2022, the ministère de la Santé et des Services sociaux, is collecting high-quality biological samples and medical data from coronavirus-infected patients. As of March 31, 2022, the BQC19 has recruited 4,437 participants and collected around 32,000 samples through a network of 10 clinical sites throughout Québec. The samples and the clinical and omics data are being made available to scientists.

In Québec, the BQC19 is collaborating closely with the HostSeq, and 2,500 patient samples have been sequenced through HostSeq, representing more than a third of the Canadian effort.

It's because of these considerable efforts to collect and analyze data that we can monitor trends in virus transmission, facilitate testing and better understand the virus' evolutionary traits, as well as patient response to infection.

In this regard, CanCOGeN has created collaborations that are highly relevant to the future of our public health. Our work with the LSPQ and the INSPQ is far from over. Indeed, the knowledge we have gained over the last two years in terms of genomic surveillance will help us better prepare for future pandemics and for other public health crises. It's in this context of continuity that Génome Québec held a consultation on the surveillance and fight against pathogens and antimicrobial resistance. This initiative made it possible to collect expert advice and make recommendations for the development of future funding programs.

GENOMICS, A CONSTANTLY GROWING FIELD

In the last year, not only has genomics continued to offer solutions and tools to combat the COVID-19 pandemic, but other flagship projects have also continued to emerge in several key sectors of our economy. Increasingly, the numerous clinical and industrial applications are addressing the needs of government and society. The expertise and assets accumulated over the years in this disruptive sector are now essential tools for attracting investment and talent. At the heart of other growth sectors, like artificial intelligence, precision medicine, cellular and gene therapies, messenger RNA and biomanufacturing, genomics will help propel Québec nationally and internationally. It is fertile ground for innovative alternatives that can both address major health challenges and stimulate a sustainable and environmentally friendly economy.

This work would never have been possible without the commitment and continued efforts of the Scientific Affairs team, in close collaboration with the research community. The team is strengthened by its resilience, excellence and diligence, and I would like to thank them for their efforts, their outstanding contribution and their dedication to science.

As Medical Director of the INSPQ's Laboratoire de santé publique du Québec, I want to recognize the progress our institution has been able to make thanks to Génome Québec's support.

The use of second-generation sequencing and genomics in microbiology is an emerging technology that will, in the future, allow for better precision in the investigation of outbreaks, a diagnostic capacity complementary to traditional methods, and surveillance programs that can go further into detail with the available information.

The CanCOGeN SARS-CoV-2 sequencing program, administered by Génome Québec, has greatly improved sequencing capacities in the lab, refined the mechanisms for data analysis and treatment, and shown decision makers the usefulness of surveillance with the help of second-generation sequencing. This will facilitate the development of future projects using this technology, with public health stakeholders seeing clearly the advantages of this type of analysis.

The Génome Québec team has been at the LSPQ's side, both during the initial requests and throughout the project, which has helped immensely in making it go more smoothly. My sincere thanks to the whole team!

Judith Fafard, M.D., FRCPC
Microbiologist-infectiologist

TECHNOLOGICAL OUTREACH

PATRICK BLONDIN
Vice President, Technology Centres

“The reference genome will be a tool to attract large pharmaceutical clinical trials and foreign investment to Québec, which will also contribute to the growth of Québec’s biotech companies.”

MORE THAN ADEQUATE OPERATIONAL CAPACITY

The pandemic has made this year, just like last year, very challenging. The many waves of infections have tested the strength of our operational capacity many times over. With our infrastructure and our partnership with the Institut national de santé publique du Québec’s (INSPQ) Laboratoire de santé publique du Québec (LSPQ), it is fair to say that the logistical challenges were brilliantly met. Génome Québec’s technology centres, including the Centre d’expertise et de services (CES), and the Génome Québec and CIUSSS du Saguenay–Lac-Saint-Jean Biobank, have certainly delivered, and we’re very proud of that. It’s clear that adapting our operations, since the beginning of the pandemic, has required tremendous alertness and agility from both our infrastructure and our staff.

After settling into new premises last year, we are still moving forward on the project to build a permanent space in the CHU Sainte-Justine. However, that hasn’t prevented the CES from tackling numerous logistical challenges. The teams have been able to maintain their regular services and also lend their expertise to both Québec and Canadian initiatives to fight COVID-19.

As this health crisis is not over, we have continued to showcase genomics for its pragmatic and technological utility. The fact is that genomics is becoming better known by government authorities and the general public, and the same goes for our services. Among other things, Génome Québec has grown from this situation, given the many collaborations that have resulted from this situation.

INTERNATIONAL RECOGNITION FOR THE CENTRE D’EXPERTISE ET DE SERVICES

Located in Montréal, the CES is the biggest integrated service provider for sequencing, genotyping and biochips in Canada, with revenues of $16.1M in 2022. It serves users from the scientific, academic and industrial community, in Québec, in the rest of Canada and around the world. Thanks to an $8.1M investment from the ministère de l’Économie et de l’Innovation and from Génome Québec, the CES will relocate this fall in new labs at the CHU Sainte-Justine. In Canada, the CES is now recognized as the leader in genomics services, with state-of-the-art platforms. Its reputation transcends borders, and international demand continues to grow.

CENTRE D’EXPERTISE ET DE SERVICES GÉNOME QUÉBEC

Origin of the 1,016 annual users

OFFERING OUR EXPERTISE FOR A BETTER MANAGEMENT OF THE HEALTH CRISIS

The partnership, designed to support the Québec government in managing the pandemic and led by the LSPQ jointly with the Fonds de recherche du Québec and Génome Québec, was presented as a COVID-19 variant monitoring program in Québec. It is also important to note that the McGill Genome Centre, the National Microbiology Laboratory and many other research teams also participated in implementing this program. This initiative aimed to sequence 65,000 positive COVID-19 samples at the end of 2021. That goal was surpassed, with 73,000 viral sequences completed in Québec, including more than 20,000 positive samples sequenced at the CES. This progress would never have been possible without this solid collaboration between everyone involved.

GÉNOME QUÉBEC AND CIUSSS OF SAGUENAY–LAC-SAINT-JEAN BIOBANK

It is interesting to observe the growth of the Génome Québec and CIUSSS du Saguenay–Lac-Saint-Jean Biobank. This technological infrastructure has delivered an outstanding performance in the COVID-19 response efforts. This world-class, state-of-the-art biobank is dedicated to the management and conservation of biological samples. As part of the work on COVID-19, these samples can help isolate and sequence the virus to track its evolution and spread. The biobank also supports cohorts like CARTaGENE, Genizon and many other biodiversity initiatives. Since July 2020, the biobank has also been storing more than 400,000 positive COVID-19 samples collected in Québec's testing centres. The infrastructure's capacity does not end there; including all other types of samples, the total number at the end of the last fiscal year was over 16 million.

A REFERENCE GENOME FOR THE POPULATION OF QUÉBEC: GENOREF-Q

Launched in 2009 with the help of a massive investment from Génome Québec and Genome Canada, the CARTaGENE population cohort consists of biological samples (whole blood, plasma, serum) paired with medical data from more than 400,000 Québecers between the ages of 40 and 69 at the time of recruitment. CARTaGENE is a research tool supported by Génome Québec and is very scientifically valuable. This public infrastructure aims to facilitate research on population genomics and contribute to the development of better diagnostic tools, treatments and disease prevention programs.

Génome Québec has begun genotyping more than 18,000 samples from the CARTaGENE cohort. This year, 900 samples, out of a cohort of 2,000 participants, have been sequenced as part of GenoRef-Q. This represents considerable progress that will help create a reference genome representative of the population of Québec. This genome will contain a catalogue of genetic variations that will be very useful in interpreting the various mutations present in our population. By providing information on variants specific to the population of Québec, the reference genome will allow us to better take advantage of the benefits of precision medicine and will also provide significant economic benefits.

In addition, the data will be available to the research community to help in the development of customized methodologies to analyze and communicate comprehensive genomic information to clinicians. This will promote collaborations between consortiums, as well as other national and international genome reference initiatives.

The reference genome is a valuable resource for developing precision medicine tools, including machine learning and artificial intelligence approaches, to predict the risk of developing chronic illnesses like diabetes and hypertension. These methods require very large data sets. CARTaGENE will also help in the development of predictive tools calibrated to Québec's modern multi-ethnic population.

QUALITY ASSURANCE FROM GÉNOME QUÉBEC

On a different note, we have decided to implement a quality assurance program. Inspired by the best certifications in the field, it fulfils our intention to perfect the evaluation and monitoring of our key performance indicators. This internal program will also enable us to maintain our quality standards in our operations and to ensure excellent service to the scientific research community.

As the new Vice President, Technology Centres, I quickly realized the enormous potential of the team of experts in place. I have the privilege of working with passionate people, and I am confident that together, we will continue to offer very high-quality services to our clients.

I want to thank all the technology centre staff for their perseverance, professionalism and outstanding team spirit.

GenomeQuébec
CES | CENTRE D'EXPERTISE ET DE SERVICES

GenomeQuébec
BIOBANQUE GÉNOME QUÉBEC ET CIUSSS DU SAGUENAY–LAC-SAINT-JEAN

With revenues of more than $16.1M and serving 1,016 research teams from 21 countries, including 45 private companies and 100 academic users outside Canada, the CES and the biobank have shone as much through their regular activities as through their contribution to the COVID-19 response.

The population of Québec can count on our technology centres to produce very valuable genomics data, ensure scientific and economic competitiveness, create wealth, save lives and aspire to improve well-being in the population as a whole.

PUBLIC OUTREACH AND EDUCATION

MARIE-KYM BRISSON
Vice President, Strategic Development and Public Affairs

“With an increase in subscribers to our social media accounts and in requests for journalistic interviews, media interest in key genomics concepts seems to have grown.”

GENOMICS: AN ESSENTIAL ASSET FOR THE DEVELOPMENT OF OUR SOCIETY

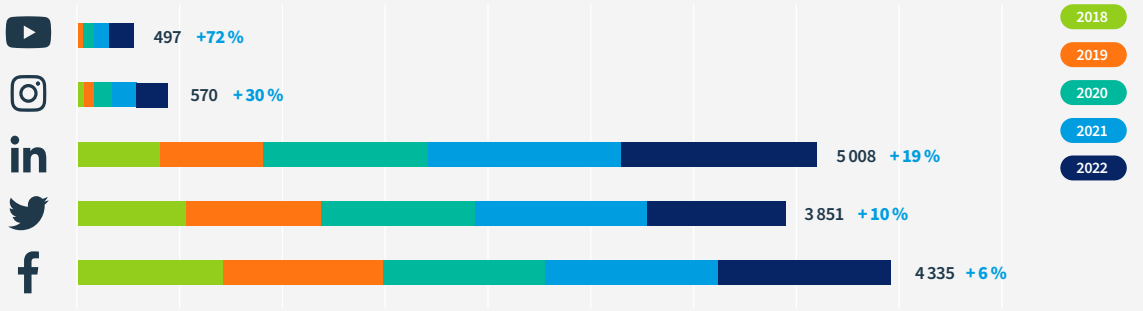
This year, just like last year, has undeniably been marked by the COVID-19 pandemic. However, it is clear that last year required more effort and adaptation; our society was then facing a situation it had practically never faced before. In this context, genomics has solidified its relevance as an essential asset, certainly in pandemic management, but also in the development of strategies and solutions concerning climate change and the evolution of health care. Genomics is a disruptive technology in growing demand, and with good reason. That’s why Génome Québec has had to continue to articulate clear and relevant messages that could resonate with the economic and scientific benefits of genomics.

EXPANDING THE SCOPE OF GENOMIC SOLUTIONS IN LINE WITH PUBLIC POLICY

The year 2021–2022 has been very constructive and rewarding in terms of the many government consultations we have been able to participate in. Our goal was clear: to catalyze the development and excellence of genomics research, its integration and its democratization. In order to demonstrate the research, technologies and applications that emerge from genomics, we have started many conversations and solidified others. The development of new provincial government strategies justifies the relevance of these conversations. More concretely, we have seen that the *Stratégie québécoise des sciences de la vie* and the *Stratégie québécoise de la recherche et de l’innovation* are focusing on future-oriented sectors such as genomics, precision medicine, cellular and gene therapy, messenger RNA, biomanufacturing and artificial intelligence to propel Québec’s economy.

Thanks to Génome Québec’s proactive work alongside the ministère de l’Économie et de l’Innovation and the ministère de la Santé et des Services sociaux, genomics has an ever-increasing presence in public policy. We were delighted to see that the *Plan pour mettre en œuvre les changements nécessaires en santé* highlights the role of genomics in the discovery of new treatments and drugs, and in the research and innovation paving the way to precision medicine. This is an important recognition of the role genomics plays and will continue to play in the trajectory of health care.

SOCIAL MEDIA - EVOLUTION OF THE NUMBER OF MEMBERS



With the ongoing support of the Québec government for more than two decades, Québec now has a critical mass of enviable expertise and infrastructure that allow us to position ourselves as a key player in Québec's bioeconomy, and thus to remain a national and international leader.

BRIEFS SUBMITTED

Génome Québec has also given its views on public policies by submitting two briefs. The first was submitted to the ministère de l'Économie et de l'Innovation, as part of consultations on the *Stratégie québécoise de la recherche et de l'innovation*, and the second was submitted to the ministère des Finances during the *Consultations prébudgétaires*. These strategic positioning documents demonstrate the power of genomics in creating value and economic and social benefits for Québec. Genomics also contributes to preserving Québec's reputation in life sciences innovation.

TEACHING GENETICS IN HIGH SCHOOL: PREPARING A REVIEW OF EMPIRICAL RESEARCH IN EDUCATIONAL STUDIES

Last year, Génome Québec granted a special mandate to the Équipe de recherche en éducation scientifique et technologique de l'Université du Québec à Montréal, led by professor Pierre Chastenay. This mandate provided for a systematic review of empirical research on educational studies between 2009 and 2019. This process identified successful initiatives in high school bioscience education. The report, now available, has led to the publication of an article in the fall edition of the Québec Science magazine, as well as the presentation of the Dix ans de recherches en sciences de l'éducation à propos de l'enseignement de la génétique au secondaire webinar on DNA Day (April 25) last year. For Génome Québec, building on the report's findings was a constructive way to keep the dialogue going and to create strategic partnerships with education stakeholders. We want to thank the Association pour l'enseignement de la science et de la technologie au Québec for its logistical and strategic support throughout this initiative. This partnership has allowed us to cement our place in Québec's education network.

GENOMICS IN THE MEDIA

When it comes to communication, our goal is clear: to showcase the excellence of Québec's genomics research. That's why Génome Québec has launched various initiatives, highlighting success stories and visual productions on the applications of genomics. These communications have enabled us to consolidate our communication positioning and our visibility on social media.

We also paid tribute to the great visionary builder, Dr. Michel G. Bergeron. Many times throughout his career, he has succeeded in using genomics technologies to the benefit of health care. Among other things, he contributed to several advances in antibiotic resistance. For instance, he participated in developing 20 or so antibiotics and discovered that many microbes have the ability to develop enzymes that can destroy antibiotics. A media campaign was carried out in collaboration with Québec International and Genome Canada, with a video presenting his important contribution to genomics throughout his career. An article was also published in La Presse+.

Read the article → Watch the video →

In a similar vein, we also want to share the story of Laurent Tessier, a young man of 17 who survived an aggressive cancer thanks to a genetic research program offering personalized treatments to young patients. Indeed, genomic profiling has made it possible for many kids and teenagers to have their genome analyzed after a cancer diagnosis. That's what saved Laurent's life. This story was published in La Presse+ in January 2022. It was also picked up by some radio shows and by The Globe and Mail. The story was then shared in our website's news section and on our social media channels.

Read the article →

It is also worth mentioning that Génome Québec closed out its 21st anniversary with a new corporate video, which was first presented to staff, then broadcast to the public in digital spaces bought on the Québec Science website and its newsletter in March 2022. Posts on our social media channels rounded out this communication effort.

Content creation has become our tool of choice for making our voice heard more often in the public space, but also in the digital space. Indeed, media and journalistic interest in key genomics concepts, like the terms DNA and RNA, seems to have grown. We have seen an increase in the number of requests for interviews from journalists, and this observation about traditional media fits quite well with the increase in our social media following. Our visibility continues to grow steadily, which is good news for genomics research.

MISSION eDNA: EVER-GROWING IN POPULARITY

For its third edition, the Mission eDNA citizen science project has, once again, successfully piqued the scientific curiosity of many of Québec's young students. This year, the project continued to grow, with 21 schools and more than 1,200 students. During the project, teens, adults and scientists joined forces to conduct scientific research in order to outline the ecosystem of Québec's waterways. The research, developed in collaboration with the ministère des Forêts, de la Faune et des Parcs and the ministère de l'Environnement et de la Lutte contre les changements climatiques, and with financial support from Hydro-Québec and the ministère de l'Économie et de l'Innovation, took place in the Capitale-Nationale, Chaudière-Appalaches, Bas-Saint-Laurent and Saguenay-Lac-Saint-Jean regions, and, for the first time, in the Outaouais region as well. We are also pleased to have signed an agreement with two Native bands: the Eastmain and the Waskaganish. The agreement will allow this activity to take place on their territory, in close collaboration with their communities. First Nations involvement allows us to broaden the project's educational scope to include Indigenous traditional knowledge. As in previous years, representatives from both departments involved have confirmed the value and relevance of the results obtained to support their respective research and to contribute to informed decision making as it pertains to the health of Québec's waterways.

INTERNAL COMMUNICATION: STRENGTHENING THE SENSE OF BELONGING AMONG REMOTE STAFF

The requirement for many of the staff to work mostly remotely again this year has been a major challenge in terms of internal communication. This situation has strengthened our conviction to find ways to preserve the sense of belonging in our organization, despite the digital format. It seemed to us the perfect time to begin designing Génome Québec's internal portal, intended for all members of staff. This multichannel network will be a new way to share important messages and will make it easier to consult many corporate documents. While proudly displaying the organization's brand image, this internal portal will improve communication and exchanges between teams and departments.

To conclude, I want to sincerely thank the members of the Strategic Development and Public Affairs team, who have thrived in the face of adversity and performed beyond expectations. Thanks to their versatility and creativity, the team members were able to find solutions in order to maintain stability, despite a change in the organizational matrix. Finally, I must also commend their outstanding adaptability and intellectual curiosity, assets that have greatly contributed to the team's motivation and resilience.

Thanks to the lifting of many health restrictions in spring 2022, we were able to tour the schools that had participated in the 2021–2022 edition of Mission eDNA to present the results. It is fascinating to note the presence of 14 species of invertebrates and 23 species of fish across the 16 waterways analyzed.

However, the young scientists also detected an invasive exotic species: the tench. The tench (or doctor fish, golden tench) is part of the cyprinidae family. It can be recognized by its deep, laterally compressed body and its slimy skin covered in small scales.

Environmental DNA does allow for the mapping of rare and invasive species in a given ecosystem, but more importantly, it allows for the monitoring of these ecosystems from the perspective of sustainable development.

FINANCIAL ACTIVITY REPORT

MARC BERGERON
Vice President, Finance and Administration

"Thanks to a fiscal year resulting in healthy growth in activities, Génome Québec has made a significant rebound in 2021–2022, reaching over $70M in investments.."

A YEAR OF SIGNIFICANT RECOVERY

In addition to the contributions from the Government of Québec and Genome Canada, a significant portion of Génome Québec's funding comes from its other partners.

As of March 31, 2022, our portfolio included 112 research projects and two technology centres in operation. During the 2021–2022 fiscal year, Génome Québec invested $47.1M in its activities. This amount, combined with the $23.6M invested by our partners, brings our overall injection of funds to $70.7M.

For the second year in a row, the pandemic has had a significant impact on our activities, in addition to prolonging remote work for many members of staff. However, our activities have picked up again, both for research projects and for technology centre services. A sign of the organization's success, the number of research projects in our portfolio has risen by 15% because of projects linked to COVID-19, like the Canadian COVID-19 Genomics Network and the Biobanque québécoise de la COVID-19. In addition, Québec's COVID-19 variant monitoring program, conducted in collaboration with the Laboratoire de santé publique du Québec, and the launch of the GenoRef-Q initiative, have truly solidified the marked recovery of our overall activities. This explains how we've achieved fiscal balance in another unusual year.

The excess of revenues over expenses, totalling $820,853, is derived from the technology centre surplus of $1,415,894, minus $595,041 in activities carried out without government funding: strategic development, Administrative Centre operating costs, and researcher support. Research projects represented $46.1M in activities, compared to $41.3M for the previous year. This excellent performance is due to Genome Canada's competitions *Genomics and Precision Health; Genomic Solutions for Natural Resources and the Environment; and Genomic Solutions for Agriculture, Agri-Food, Fisheries and Aquaculture*, as well as Génome Québec's stand-alone genomics integration programs, and initiatives that contributed to the fight against COVID-19. The budget for these projects totalled $219M, $74.5M of which are still to be completed.

The technology centres posted $17.3M in revenues for the fiscal year, a 44% increase from the previous year. The centres posted an excess of revenues over expenses of $1,415,894, compared to $1,068,672 in the previous year.

General and administrative expenses amounted to $2,695,928, a $168,338 increase compared to the previous year. After certain adjustments, these expenses represented 3.81% of the year's overall investment.

Expenses for strategic development were $509,658, compared to $470,695 last year.

Unrestricted net assets diminished by $672,756 to $1,828,149 as of March 31, 2022. Net assets restricted for research and infrastructure projects totalled $1,333,151. Net assets allocated to the contingency and technology investment fund increased to $3,422,689.

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

Daniel Coderre
President and CEO
Génome Québec

Marc Bergeron
Vice President, Finance and Administration
Génome Québec

STATEMENT OF FINANCIAL POSITION MARCH 31, 2022, WITH COMPARATIVE INFORMATION FOR 2021

The following Statement of Financial Position as at March 31, 2022 and 2021, and the Statement of Operations for the years ending March 31, 2022 and 2021 are provided as illustrative summaries only and are not intended to replace the full audited financial statements of Génome Québec.

The full financial statements of Génome Québec were audited by KPMG LLP, Chartered Professional Accountants, and reported on June 17, 2022.

ASSETS

	2022	2021
Current Assets		
Cash and cash equivalents	$2 578 648	$2 999 022
Short-term investments	$54 004 817	$56 318 768
Accounts receivable and work in progress	$2 952 172	$2 946 999
Contributions to be received	$25 000	—
Advances to genomics research projects	$7 997 513	$5 503 332
Stocks	$1 547 288	$2 019 358
Prepaid expenses	$730 108	$508 798
	$69 835 546	**$70 296 277**
Long-term investments	$2 047 588	$17 927 362
Capital assets	$6 497 406	$4 890 690
	$78 380 540	**$93 114 329**

LIABILITIES AND NET ASSETS

	2022	2021
Current liabilities		
Accounts payable and accrued liabilities	$4 199 074	$3 810 633
Obligations from an agreement	$394 167	—
Deferred revenues	$502 512	$705 285
	$5 095 753	$4 515 918
Deferred contributions - Future expenses	$60 276 625	$77 783 040
Deferred contributions - Capital assets	$4 234 713	$3 474 752
Deferred lease inducements – leasehold improvements	$341 535	$388 475
Deferred lease inducements – other	$320 934	$247 353
Obligation arising from a long-term agreement	$585 336	—
	$70 854 896	**$86 409 538**
Net assets		
Unrestricted	$1 828 149	$2 500 905
Restricted – Invested in capital assets	$941 655	$1 027 463
Restricted – Technology investment and contingency funds	$3 422 689	$2 279 303
Restricted – Research projects	$1 333 751	$897 120
	$7 525 644	**$6 704 791**
	$78 380 540	**$93 114 329**

INCOME STATEMENT

	2022	2021
Revenues		
Amortization of deferred contributions related to future expenses	$30 327 800	$26 800 789
Amortization of deferred contributions related to capital assets	$1 298 804	$1 132 900
Investment and intellectual property revenues	$1 930	$1 077 470
Revenues from technology centres	$17 273 696	$ 12 022 834
Other revenues	—	$51 952
	$48 902 230	**$41 085 945**
Expenses		
Genomics research projects	$22 842 690	$19 734 258
Technology centres operational costs	$20 388 482	$15 591 064
General and administrative expenses	$2 695 928	$2 527 590
Strategic development	$509 658	$470 695
Depreciation of capital assets	$1 285 960	$1 132 900
Depreciation of restricted capital assets	$358 659	$339 851
	$48 081 377	**$39 796 358**
EXCESS OF REVENUES OVER EXPENSES	**$820 853**	**$1 289 587**

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Tu Linh Van

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Nathalie Émond
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Berchnaude Vernet
Annie Verville
Hao Fan Yam
Mona Zmit
Corine Zotti

BIOBANK

Steve Arsenault
Nancy Tremblay

CORPORATE INFORMATION

For more information, please contact:

Antoine Gascon
Specialist, Communications and Public Affairs
T 514 377-5613
agascon@genomeQuébec.com

THANKS TO OUR PARTNERS

Québec

GenomeCanada

HEAD OFFICE

630 René-Lévesque Blvd West, Suite 2660
Montréal, Québec H3B 1S6
T 514 398-0668
gqinfo@genomequebec.com
genomequebec.com

CENTRE D'EXPERTISE ET DE SERVICES GÉNOME QUÉBEC

3175 Chemin de la Côte-Sainte-Catherine
Montréal, Québec H3T 1C5
T 514 398-7211
infoservices@genomequebec.com
cesgq.com

GÉNOME QUÉBEC ET CIUSSS DU SAGUENAY-LAC-SAINT-JEAN BIOBANK

305 St-Vallier Street
Chicoutimi, Québec G7H 5H6
T 514 398-7211
infoservices@genomequebec.com

AUDITORS KPMG LLP

600 de Maisonneuve Blvd West, Suite 1500
Montréal, Québec H3A 0A3
kpmg.ca

LEGAL ADVISER

Me Jean Brunet
Stein Monast, S.E.N.C.R.L.
70 Dalhousie Street, Suite 300
Québec, Québec G1K 4B2
steinmonast.ca

MINISTÈRE DE L'ÉCONOMIE ET DE L'INNOVATION

710 place D'Youville, 3rd floor
Québec, Québec G1R 4Y4
economie.gouv.qc.ca

GÉNOME CANADA

150 Metcalfe Street, Suite 2100
Ottawa, Ontario K2P 1P1
genomecanada.ca