

INNOVATION COMES TO LIFE

2017-2027
QUÉBEC LIFE
SCIENCES
STRATEGY

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MESSAGE FROM THE PREMIER

Stimulating innovation in every region is central to the Québec government's economic development strategy. Innovation must continue to come alive throughout Québec in both new and more traditional economic development sectors. That is how we will succeed in setting ourselves apart on the world stage and create more stimulating jobs in all regions.

In Québec, the life sciences sector represents 630 companies and generates nearly 31,000 industrial jobs. Our researchers are recognized beyond our borders, our companies are visionary, and our workers are creative. Together, we have the means to further develop this promising sector and drive it ever forward.

To do this, we must continue to turn new 21st century challenges into development opportunities. The global economy is constantly changing. More than ever, what happens abroad affects us directly, and digital technology is growing increasingly important.

With the Québec Life Sciences Strategy, our government is meeting these challenges by proposing concrete measures that will drive the entire industry. We will provide companies and research institutions with more support for new projects. We will attract new private investment. We will accelerate the integration of technology and innovations into the health and social services network.

Together, we will participate in this new economy and this knowledge society. Let's continue to support Québec's progress toward change together.

Premier of Québec

Philippe Couillard



MESSAGE FROM THE MINISTER OF ECONOMY, SCIENCE AND INNOVATION AND THE MINISTER RESPONSIBLE FOR THE DIGITAL STRATEGY

The life sciences industry is one of the most exciting and innovative sectors of the Québec economy. Our organizations have plenty of ideas to grow and further promote this important sector, especially when it comes to innovation. They know how to set themselves apart through their approaches and forward-looking projects, which create wealth and good quality jobs.

Our government is making it a priority to support the growth of this industry, whose complete and diversified innovation chain known for its partnerships at home and abroad helps make Québec a key player and an ideal destination for investment.

With its Québec Life Sciences Strategy, our government has set ambitious goals, namely to attract \$4 billion in private investment by 2022 and position Québec as one of North America's top five life sciences hubs by 2027.

We are proposing measures that will foster the creation and growth of innovative companies and the integration of new technology into the health and social services network. What's more, our concerted efforts will boost investment in research and innovation in the industry as a whole.

Be among those who dare to innovate and act to ensure Québec's life sciences industry is a success!

Minister of Economy, Science and Innovation and Minister responsible for the Digital Strategy

A handwritten signature in blue ink, appearing to read 'D. Anglade', with a long, sweeping flourish extending to the right.

Dominique Anglade



MESSAGE FROM THE MINISTER OF HEALTH AND SOCIAL SERVICES

Innovation in the form of promising new technology integrated into the heart of the health and social services system is synonymous with a more competitive and higher-performing Québec. It is also a driver of change. Through innovation, we can optimize Québec's health and social services system and improve quality of life for all of Québec.

Adopting and using the technology of Québec's life sciences companies in the health and social services system is vital to the industry's future growth in Québec and abroad.

We are excited to see companies and stakeholders in the health and social services system working collaboratively and successfully together to promote the life sciences. Joining forces is the best and surest way to ensure prosperity for the Québec of tomorrow.

Minister of Health and Social Services

A handwritten signature in blue ink, reading "Gaétan Barrette". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Gaétan Barrette

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2017–2027 QUÉBEC LIFE SCIENCES STRATEGY

INNOVATION
COMES TO LIFE

INTRO
DUCTION



INTRODUCTION

INTRODUCTION

The Québec government is releasing the Québec Life Sciences Strategy, *Innovation Comes to Life*, for 2017–2027.

In 2009 it adopted and implemented a biopharmaceutical strategy. This new strategy dedicated to life sciences—one of the most innovative sectors of Québec’s economy—is the first ever designed and introduced by the government.

The Québec Life Sciences Strategy has four objectives and a financial framework of \$205 million for the next five years, which includes \$151 million in new funding from the 2016–17 and 2017–18 Quebec budgets.



Source: Attasciences

A key industry for the Québec economy

In 2014 the life sciences sector was estimated to contribute \$5.6 billion to Québec's gross national product (GNP).¹

A sector active in health care

The life sciences sector encompasses companies dedicated to both human and animal health. Activities range from basic research to the marketing of products and services.

Many types of businesses

Pharmaceutical companies develop, manufacture, or commercialize drugs or therapeutic products. Biotechnology companies, which are smaller, also develop new therapeutic products, platforms, or processes.

Contract research organizations offer the life sciences industry specialized research services. Contract manufacturing organizations offer pharmaceutical or natural health product manufacturing services.

There are also medical technology and health information technology companies that design, develop, manufacture, or commercialize physical or digital medical products other than drugs. These products are used for preventive, diagnostic, or therapeutic purposes or the delivery of health services.

Natural health product companies that identify, extract, process, and combine natural substances to commercialize them.

Traditionally it has been easy to classify companies by category. Nowadays their activities are increasingly diversified, blurring the boundaries between types of companies.

Québec's strengths in the life sciences sector

Québec has undeniable strengths in many life sciences fields, such as cardiology, neuroscience, oncology, infectiology, genomics, imaging, digital health, rehabilitation, and sports medicine. We owe these strengths to the research conducted in institutions of higher education and to the quality of training they provide.

In 2016 the life sciences industry numbered about 630 companies, providing 30,800 well-paid jobs.² The average salary in the industry was 63% higher than the overall Québec average.³ In addition to these jobs, industry spinoffs create nearly as many jobs in public research centers and various related service companies.

In the past five years, private industrial projects worth over a billion dollars have been completed in Québec's life sciences sector.⁴

THE QUÉBEC LIFE SCIENCES STRATEGY HAS FOUR OBJECTIVES AND A FINANCIAL FRAMEWORK OF \$205 MILLION FOR THE NEXT FIVE YEARS, WHICH INCLUDES \$151 MILLION IN NEW FUNDING FROM THE 2017–18 BUDGET.

1. *Les sciences de la vie et des technologies de la santé (SVTS): Vecteur d'innovation et de croissance économique*, Montréal InVivo, Life Sciences and Health Technologies Cluster, February 2017.

2. Estimate from Ministère de l'Économie, de la Science et de l'Innovation based on various sources.

3. *Economic value of the LSHT innovation chain*, Montréal InVivo, July 2015.

4. Estimate from Ministère de l'Économie, de la Science et de l'Innovation.



QUÉBEC'S LIFE SCIENCES SECTOR: A STRONG PRESENCE IN THREE REGIONS

Life sciences companies are located mainly in the greater Montréal area. The Capitale-Nationale and Estrie regions have also developed activities and specialties that are now extremely successful.

Montréal

Over 80% of the industry's jobs are concentrated in the Montréal area, particularly Technoparc de Montréal and the Biotech City in Laval.

In recent years, considerable effort has been made to spur the development of personalized healthcare projects and stimulate early clinical research.

Québec City area

The Québec City area excels in vaccines and diagnostics.

Successful collaborations between research centers (including the Infectious Disease Research Center) and businesses large and small, including internationally recognized names, drive these top-performing sectors. This serves as an incubator for innovative new technologies and has contributed to the presence of a thriving niche industry in life sciences.

Our goal is to leverage this niche into commercial success, attract capital, develop industrial infrastructure and cutting-edge research, and ensure the creation and growth of prosperous, innovative businesses that address health population challenges around the globe.

Eastern Townships

The Eastern Townships specialize in support for individual autonomy. It is home to SAGE-Innovation, whose goal is to create a niche area of expertise by fostering innovation in the field and supporting structural initiatives.

The strengths of this niche lie in both its multidisciplinary character and the synergy of sector partners. With numerous organizations and institutions specialized in aging and autonomy, this niche is fostered through collaborative projects with private companies.

Source: Ennovi

A sector undergoing a sea change

The life sciences sector has been undergoing a sea change in recent years.

Healthcare cost control

In developed countries, governments are seeking to control healthcare costs as their populations age and chronic disease becomes more prevalent. Companies must therefore develop effective, cutting-edge innovations to meet needs while staying within the tight budgetary framework of public payers.

This trend affects medical technologies in particular. Paying agencies are more willing to pay for innovations that offer greater value in terms of efficiency and effectiveness of healthcare delivery.

To increase the value of innovations, medical technology companies work outside their traditional areas of activity to propose more integrated solutions.

Challenges to development and commercialization

Alongside issues related to the control of public healthcare expenditures, many challenges must be met to develop and commercialize drugs or health technologies.

The cost of research and innovation continues to increase as regulatory requirements aimed at minimizing risk for patients expand. Mass-market products are increasingly rare.

Products that reach the market now target smaller numbers of patients and address increasingly specific health problems. Many products never make it to market or, if they do, never generate enough revenue to recoup R&D costs.

A new business model

Pharmaceutical companies have had to rapidly adapt their business model to this new reality. To spread the risk and alleviate some of the cost, they have chosen to outsource their activities, from discovery to the manufacture of commercial batches. One strategy has been to conclude partnerships with public research institutions.

Decline in the number of research centers

In line with this strategy, pharmaceutical companies have reduced the number of private research centers they operate around the world. Small startups have developed more in virtual mode.

Québec has not been spared by this rationalization, but it has adapted and managed to benefit from this business model centered on partnerships and outsourcing. The number of businesses offering R&D and specialized manufacturing services has grown significantly in recent years. A dozen such companies were created in Québec between 2012 and 2016.⁵

Advent of the digital age

The advent of the digital age in health care will without a doubt be the next main driver of change, especially in pharmaceutical and medical technology. Technology from such disciplines as data science, deep learning, and artificial intelligence has the potential for breakthrough innovations in life sciences.

Digital technology is a revolution that is also changing the way health care is organized and delivered. The benefits it provides will be numerous.

Included among these are:

- Faster and easier communication between care providers. The Québec Health Record, for example, gives doctors and other healthcare professionals access to essential information for responding quickly and providing patients with quality care
- Access to specialized resources in remote regions through telemedicine
- The possibility for patients to take charge of their health more easily and more actively

The Digital Strategy will define an overall vision for Québec's transition to a digital society. It will also include action plans by sector.

5. Estimate from Ministère de l'Économie, de la Science et de l'Innovation.

The Québec Life Sciences Strategy: Building a sound, sustainable industry

With the Québec Life Sciences Strategy, the government is seeking to build a business environment adapted to these new realities and foster an “innovation first” mentality to help the industry thrive and grow sustainably.

Québec intends to accelerate growth by supporting research, providing help with financing, and stimulating the creation of quality jobs along the entire innovation chain.

The government as catalyst

The government will play the role of catalyst by fostering a business environment that is predictable, stable, and stimulating.

It will do this by leveraging the work of the Life Sciences Working Group, which benefited from the input of key players in the life sciences ecosystem.

This dialogue with the industry will continue throughout the rollout of the Québec Life Sciences Strategy. The Strategy will be an opportunity for the entire ecosystem to come together around objectives that all support and share, and to work together to meet them.

Rollout of the Québec Life Sciences Strategy

The Québec Life Sciences Strategy will be implemented over a period of ten years, from 2017 to 2027. The government is presenting an initial five-year financial framework for 2017–2022.

The Strategy will be monitored through close dialogue between the government and the main life sciences industry players. Annual meetings between government representatives and the main industry associations will be held to report on Strategy progress and confirm future directions.

Growth in two cross-cutting niches

The Québec Life Sciences Strategy will seek to strengthen two major market niches with great growth potential:

- Precision medicine
- Use of big data in the health sector

Québec has world-leading researchers and organizations in these two niches and must continue to encourage young people to train in the field. They are cross-cutting niches whose development will play to all of Québec’s research strengths.

Focusing on these two important areas will also provide Québec with a unique, ambitious, and visionary international positioning and ultimately attract greater private foreign investment and help develop a new industrial sector.



Source: Institut NEOMED

GROWTH IN TWO CROSS-CUTTING NICHES

Precision medicine

Precision medicine⁶ is an approach based on prevention and treatment that takes into account the genetic makeup, environment, and lifestyle of the individual. Precision medicine is used to determine which prevention and treatment strategies are best for a given group of patients.⁷

Québec has made a number of major discoveries in the field of precision medicine. These have led or will lead to the development of new treatments or will facilitate decision making regarding disease management.

Dr. Jacques Simard took part in characterizing the effect of mutations in BRCA1 and BRCA2, two breast and ovarian cancer susceptibility genes. When carriers of these genes are identified, it gives them the opportunity to make important decisions about their health, such as taking more active preventive action (e.g., screening tests and preventive surgery or chemotherapy).

Dr. Jean-Claude Tardif and Dr. Marie-Pierre Dubé of the Montréal Heart Institute have shown that some patients with a particular genotype respond favorably to Dalcetrapib, a drug used to treat cardiovascular disease. DalCor Pharmaceuticals was founded based on this discovery.

Emovi is a company whose technology helps knee osteoarthritis patients through personalized treatment based on their physiological characteristics.

Use of big data in the health sector

Big data is used in the health sector to enhance the value of data in order to facilitate analysis of complex situations and aid in decision making.

This new social and economic development pipeline combines a number of specialties, including data science, deep learning, artificial intelligence, operational research, and optimization. It will make it possible to develop technology that facilitates and improves the detection and diagnosis of diseases such as cancer, optimizes the use of resources throughout the healthcare system, and accelerates the discovery of new treatments.

Professor Jacques A. de Guise of the Imaging and Orthopedics Research Laboratory at École de technologie supérieure and the CHUM Research Center, is using recent technological developments to advance medical diagnostic imaging. His research uses big data and artificial intelligence techniques to develop algorithms to automatically detect structures (bones in the spinal column or lower limbs as well as dental and maxillofacial structures, etc.) in an image.

The technologies that researchers have developed are to meet needs initially identified by clinical partners and the healthcare industry. For example, in collaboration with EOS Imaging and Arts et Métiers Paris Tech, Jacques de Guise and his team have developed EOS biplanar radiography (front and side view) that provides a 3D reconstruction of the bones and the skeleton.

Québec company Imagia is also taking advantage of this niche. It has developed technology that improves the performance of computer-aided diagnosis (CADx) software for detecting cancer by drawing on deep learning and artificial intelligence. The software will be as good at detecting cancer at an earlier stage as a medical expert.

6. Precision medicine can also be called "personalized health care."

7. *Help Me Understand Genetics – Precision Medicine*, Genetics Home Reference.

MAIN TARGETS OF THE STRATEGY

Québec currently ranks tenth among North America's life sciences hubs.⁸

It is setting ambitious goals with the Québec Life Sciences Strategy. Québec plans to be one of North America's top five life science hubs by 2027. Furthermore, the Québec government is seeking to attract \$4 billion in private investment by 2022 with the sector's collaboration.⁹

Objectives of the Québec Life Sciences Strategy: Positioning Québec as one of North America's top five life science hubs

To achieve these targets, this Strategy has the following four objectives:

Increase investment in research and innovation in all life sciences

The first objective of the Strategy is to increase investment in research and innovation.

To this end, and as a result of the new business model being used by companies in the sector, the government will share more in the risks of research and innovation by investing directly in major partnerships and initiatives and promoting collaborative research.

Increased emphasis will also be placed on the potential of the health and social services network to spur investment in research and innovation. More specifically, the government will improve clinical research processes at Québec institutions and develop a general procedure for gaining access to certain databanks for research purposes.

Foster the creation of innovative companies and ensure their growth

The second objective of the Strategy is to foster the creation of innovative companies in the life sciences and ensure their growth.

The government thus intends to support Québec businesses that create jobs and wealth by:

- Promoting the seeding and startup of new businesses
- Contributing to the development of successful companies
- Fostering the emergence of new Québec flagships¹⁰

Attract new private investment

The third objective consists of attracting new private investment in the life sciences industry.

To this end, the government will ensure that consistent investment prospecting efforts are made both inside and outside Québec and that Québec's life sciences sector is promoted internationally.

Further integrate innovation into the health and social services network

The fourth objective is to further integrate innovation into the health and social services network.

Better integration will enable all Quebecers to take advantage of innovations that are developed inside and outside Québec while ensuring the sustainability of the health and social services system.

To this end, the government will set up a health and social services innovation office, aid in assessing the current healthcare situation, and promote faster access to key drugs.

8. *Les sciences de la vie et des technologies de la santé (SVTS) : Vecteur d'innovation et de croissance économique*, op. cit.

9. Private investment includes investments in R&D published by the Patented Medicine Prices Review Board (PMPRB), identification of capital investments whether supported or not by Ministère de l'Économie, de la Science et de l'Innovation, venture capital investments identified by Thomson Reuters, other spinoffs from implementation of the Québec Life Sciences Strategy, and investments identified by the industry.

10. These are companies whose growth potential and economic benefits for Québec are high.

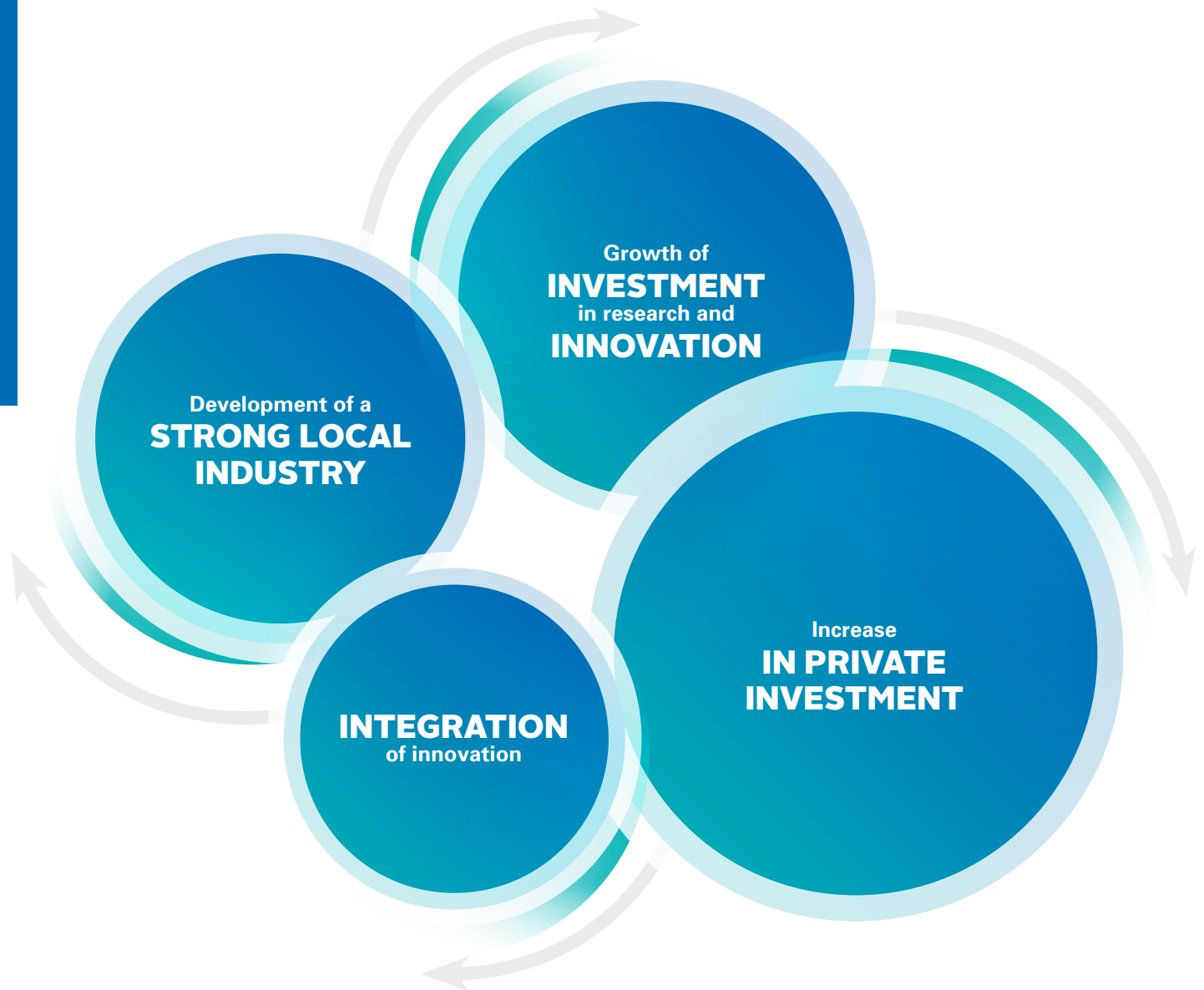
Interrelated objectives

As shown in Diagram 1, these four objectives and their implementation are interrelated.

Support for the research and innovation ecosystem leads to the creation of new businesses. A strong local industry together with research and innovation excellence attracts private investment. Integrating innovation fosters private investment and supports the local industry.

DIAGRAM 1

Québec Life Sciences Strategy: Interrelated Objectives





A MULTIPRONGED APPROACH

The Québec Life Sciences Strategy, *Innovation Comes to Life*, is based on in-depth consultation with the Life Sciences Working Group.

Life Sciences Working Group

The creation of the Life Sciences Working Group was announced in the Québec Economic Plan – March 2015. The group's mandate was to determine ways to ensure the sustainable development of the life sciences industry in Québec given the business context and the need for financial sustainability in the health and social services system.

The Working Group set up four projects dedicated respectively to:

- Research and innovation challenges
- Industry challenges
- The integration of innovation
- Québec's visibility abroad

It organized over 20 meetings attended by over 80 key players from the industry, the financial ecosystem, the world of research, and the health and social services network.

On May 9, 2016, the Working Group presented its recommendations to the Minister of the Economy, Science and Innovation and Minister responsible for the Digital Strategy and the Minister of Health and Social Services. The Québec Life Sciences Strategy, *Innovation Comes to Life*, is the outcome of these recommendations.

QUÉBEC RESEARCH AND INNOVATION STRATEGY 2017–2022

The goal of the Québec Research and Innovation Strategy 2017–2022 is to spur research and innovation in all industrial sectors in Québec.

Some major issues that also affect the life sciences are addressed in this strategy. This is the case for support for young scientists.

The Québec Research and Innovation Strategy and the Life Sciences Strategy are therefore complementary.

Source: Shutterstock

Collaborative Organizations Dedicated to Their Mission

The ecosystem of the life sciences sector is made up of a number of organizations that foster collaboration, identify priority projects, take joint action, and suggest solutions to accelerate sector growth.

DIAGRAM 2

Diagram of organizations that support the life sciences ecosystem



INNOVATION
COMES TO LIFE

INNOVATION



INCREASE
INVESTMENT IN
RESEARCH AND
INNOVATION IN ALL
LIFE SCIENCES

1

INCREASE INVESTMENT IN RESEARCH AND INNOVATION IN ALL LIFE SCIENCES

Research and innovation are the foundation of the life sciences industry. Many nations look to innovation in this sector as a means of stimulating economic development. Québec must ensure it is competitive and appealing.

To increase investment in research and innovation in all life sciences, this strategy seeks to:

- Share the risks in research and innovation with the private sector
- Exploit the potential of the health and social services network to attract more private investment

SELECTED TARGETS

Implementation of the first objective of the Québec Life Sciences Strategy seeks to achieve the following targets:

- Be the Canadian province that attracts the most investment in clinical research by 2022
- Be the Canadian province that attracts the most private investment in research by 2027

Already a strong presence for the Québec government

The Québec government invests significant amounts in the life sciences. It supports major public–private partnerships such as the collaborative Personalized Medicine Partnership for Cancer and projects supported by the Partnership Fund for an Innovative, Healthy Québec.

The Québec government also participates in funding major research projects supported by federal programs such as the Canada First Research Excellence Fund, the Centres of Excellence for Commercialization and Research Program, and Genome Canada.

Investments of nearly \$115 million in 2016–2017

In 2016–2017, the Québec government invested nearly \$115 million in programs and organizations active in health innovation research and development.

Investments announced in 2016–2017

In addition to these investments, the Québec government also announced in 2016–2017 that it would provide:

- \$40 million to Génome Québec¹¹
- \$24 million to the Québec City Mental Health University Institute Research Centre infrastructure project
- \$3 million to two research initiatives at the Montréal Clinical Research Institute, i.e., the establishment of a research center on rare and genetic diseases in adults and a project to promote the production of biomarkers, including discovery, validation, clinical trials, and the development of partnerships
- \$2 million in IRICoR projects that showcase the capabilities of proprietary platforms and help stimulate the interest of private partners (IRICoR is the commercial arm of the Institute for Research in Immunology and Cancer at Université de Montréal)¹²

CANADA FIRST PROJECTS

The objective of the Canada First Research Excellence Fund is to enable selected universities to become world leaders in research areas likely to create long-term economic benefits for Canada.

Three Québec-based projects

Three Québec-based projects with a “health” component were selected:

- The Université de Montréal data science project, in collaboration with Polytechnique Montréal and HEC Montréal
- The McGill University neuroscience project
- The Polytechnique Montréal medical technology project

The three selected institutions are already leaders; the additional money will help them expand significantly. The three Québec-based projects received a total of \$213.2 million from the federal program and will receive over \$36 million from the Québec government by 2023.

11. This investment was confirmed in the Québec Economic Plan – March 2017 for 2016–2017.

12. This investment was confirmed in the Québec Economic Plan – March 2017 for 2016–2017.

RESEARCH AND DEVELOPMENT TAX INCENTIVES IN SUPPORT OF THE LIFE SCIENCES SECTOR

For many years the Québec government has been investing in high tech companies working in the life sciences, particularly through various fiscal measures.

Research and development tax credits

Research and development tax credits are the biggest government incentives for innovation. Companies active in the life sciences that carry out such activities in Québec can benefit from three refundable tax credits:

- Tax credit on researcher salaries
- Tax credit for research contracts with universities, eligible public research centers, or research consortiums
- Tax credit for private partnership pre-competitive research

These tax credits are 30% for SMEs and 14% for large businesses. Tax assistance applies to researcher salaries, material used for research purposes, or the value of a subcontract with a university, eligible public research center, or research consortium, as applicable.

Companies can also benefit from the federal research and development tax credit in addition to Québec tax assistance. The federal tax credit rate is 35% for SMEs and 15% for large businesses and applies to researcher salaries and material used for research purposes.

Tax holidays for foreign researchers and experts

Foreigners who come to work in Québec and contribute to innovative projects can benefit from a personal income tax holiday. This tax assistance is intended for a number of individuals, particularly:

- Foreign researchers and experts working for a company engaged in research and development
- Professors and postdoctoral fellows who work for a Québec university or a public research center

The tax holiday is in the form of a deduction in the calculation of an individual's taxable income. It corresponds to 100% of the individual's salary the first two years, 75% the third year, 50% the fourth year, and 25% the fifth year.



Source: NÉOMED. Apparaissant sur la photo: employée de l'IRIC organisation résidente.

1.1 RISK-SHARING IN RESEARCH AND INNOVATION

Investments of \$75 million for partnerships and major initiatives

The government is creating the new Health Collaboration Acceleration Fund (Fonds d'accélération des collaborations en santé) with a budget of up to \$75 million, \$60 million of which is already available under the Québec Life Sciences Strategy. This funding will allow direct investment in capacity-building initiatives and collaborative projects as part of public–private partnerships worth a total of at least \$150 million.

To be selected, projects must seek to strengthen collaboration throughout the life sciences innovation chain in Québec.

The government will invest primarily in projects in cross-cutting growth niches—i.e., precision medicine and the use of big data in the health sector—and those that address health issues identified by Ministère de la Santé et des Services sociaux (MSSS).

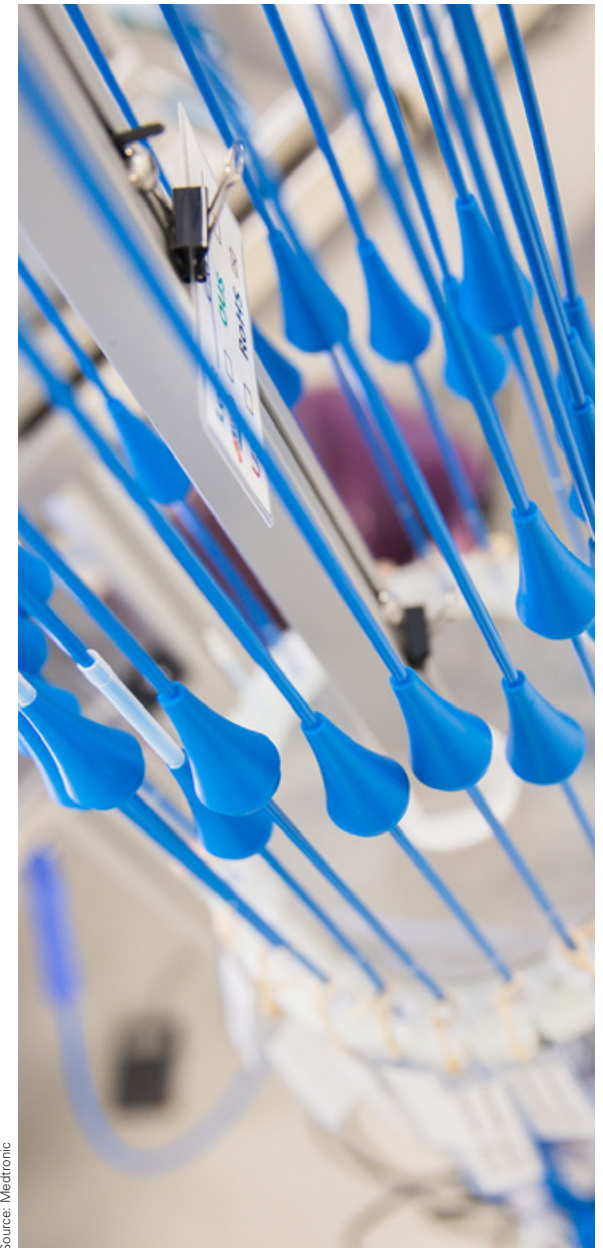
The fund will have a life span of seven years. Projects that the government invests in must be completed over a period of no more than four years.

Three calls for proposals

The government is announcing a maximum of three calls for proposals, in fall 2017, winter 2019, and spring 2020. Spreading them over time will provide more flexibility to choose the best projects over the entire duration of the Strategy.

The project selection criteria will be based on the recommendations of the Life Sciences Working Group. These are:

- Project excellence
- A collaborative approach
- Involvement of private partners
- Development or strengthening of a growth niche
- Added value for the health and social services network
- Economic spinoffs
- Strengthening of Québec's positioning abroad



Source: Medtronic

An additional \$10 million to leverage investment and accelerate collaborative research

The government is providing \$10 million in additional support for collaborative research through the CQDM and MEDTEQ research consortiums. This will make it possible to support more projects conducted in collaboration with industry.

Research collaboration projects help:

- Foster partnerships between the research community and industry
- Accelerate the development of medical technology and new drugs by facilitating access to researcher expertise and the cutting-edge equipment of universities and university hospitals
- Strengthen expertise clusters relevant to industrial research
- Train the next generation in growth niches

Québec consortiums are getting very good results in terms of economic spinoffs and leveraging. The government wishes to build on this momentum.

RESULTS BY CQDM AND MEDTEQ

CQDM

CQDM is a precompetitive drug discovery research consortium whose mission is to fund the development of innovative technologies and tools to improve the productivity of biopharmaceutical research and development. This approach helps accelerate the discovery and development process, for safer and more effective drugs.

Since its inception in 2008, CQDM has raised \$65 million from nine of the world's top pharmaceutical companies, Ministère de l'Économie, de la Science et de l'Innovation (MESI), and the Canadian government.

To date, it has set up 11 funding programs and launched 28 competitions.

Furthermore, CQDM has yielded significant benefits, such as:

- Successful completion of 22 projects
- 73% integration rate of research results in CQDM member companies
- 21 life sciences SMEs involved in technology maturation of supported projects
- Support for the creation of eight life sciences startups
- A leverage effect two and a half times the Québec government's investment

MEDTEQ: Innovation for health

MEDTEQ is the Québec consortium for industrial research and innovation in medical technology. Its mission is to accelerate the development of innovative technological solutions to improve patients' health and quality of life. MEDTEQ supports their validation and integration in the healthcare system and their impact, both locally and globally, by bringing together the complementary skills of industrial and academic partners with those of healthcare providers.

Since its inception in 2013, MEDTEQ has:

- Welcomed 110 members, of which 88% take part in the consortium's research projects (SMEs represent 57% of these members)
- Approved 32 projects worth nearly \$13 million, of which \$4.3 million is from MESI
- Provided a leverage effect double the Québec government's investment

1.2 UPGRADE OF HEALTH AND SOCIAL SERVICES NETWORK ASSETS

Clinical research makes up the majority of R&D activities outsourced by the pharmaceutical industry. Clinical studies will represent a market worth US\$64 billion in 2020¹³ worldwide. Québec has everything it needs to attract part of this market.

However, because of increased competition in certain parts of the world, Québec must become more efficient if it is to increase its power of attraction and ensure Quebecers have access to the new therapies being developed.

\$5.3 million to support early clinical research

With its new state-of-the-art university hospital research centers, Québec is well positioned to attract more early clinical studies.¹⁴

Under the Québec Life Sciences Strategy, the government confirms that \$5.3 million will be provided to support the Early Clinical Research Initiative announced in the Québec Economic Plan – March 2016. This initiative was launched by Montréal InVivo and is hosted by CQDM.

The strategic development plan for the Early Clinical Research Initiative covers the period from 2016 to 2021. The project is being conducted in collaboration with private partners.

A coordination center

The Initiative will provide Québec with a coordination center to attract early clinical study projects outsourced by pharmaceutical companies at university hospitals.

The goal is to double the number of patients who take part in early clinical studies with participating public and private organizations.

Four specific strategies

The strategic development plan in early clinical research revolves around four specific strategies:

- Optimizing operational processes
- Facilitating patient recruitment
- Promoting Québec as a location for early clinical studies
- Educating patients and healthcare professionals

Associated university hospitals

The plan will initially involve:

- McGill University Health Centre
- Centre hospitalier de l'Université de Montréal
- Centre hospitalier universitaire Sainte-Justine

Over time, the government would like all hospitals wishing to attract early clinical studies will join the Initiative.

13. *The New Trends of Global Clinical Development Outsourcing Market, Research and Markets.*

14. Before being commercialized, a product must go through several stages to ensure safety and efficacy. Three phases are required. Early studies (phases I and II) are conducted on small groups of patients. The third phase involves large groups and is used mainly to confirm product efficacy and document possible side effects.



\$5.8 million to improve clinical research processes proposed by the National Table of Research Directors at MSSS

In 2016 MSSS set up the National Table of Research Directors. The mission of this discussion table is to report on priority needs in terms of clinical activity and the organization of services and to identify solutions to research-related issues.

Under the Québec Life Sciences Strategy, a subgroup will be formed in collaboration with the Early Clinical Research Initiative to determine possible solutions to:

- Optimize processes implemented by Québec clinical research centers
- Achieve the performance standards that result when internationally accepted best practices are adopted

The government is earmarking \$5.8 million to support implementation of the table's solutions in order to improve clinical research processes that cannot be cofunded by the private sector.

IMPROVEMENT OF CLINICAL RESEARCH PROCESSES

In recent years, MSSS has introduced mechanisms to improve clinical research processes in the health and social services network.

- MSSS has defined a reference framework for authorizing multicenter research projects at public institutions in the health and social services network. Under this framework, only one ethics review is required for research projects that involve multiple hospitals, and strict deadlines are set for certain stages of the process.
- MSSS has implemented a transparent and consistent new billing rate structure for the review and authorization of research projects.

Source: Atlasciences

General procedure for access to certain databanks for research purposes

Access to research data

Access to data for research purposes is key to conducting research in health. When relevant data is available, this helps assess the real impact of innovations on the efficiency of the network and on the public. Data depth is strategically important for determining the value of an innovation.

Some databases are, however, hard to access in the health sector for those seeking to develop innovations and facilitate decision making in the health and social services network.

A government working committee

Researcher access to data is an issue in other sectors than life sciences too, and the issues are similar.

The Québec Economic Plan provides for the establishment of a working committee to develop a general procedure for gaining access to certain databanks for research purposes. Such data has great scientific and economic potential, and developing it is key to ensuring research excellence.

The working committee will develop a general procedure of access to certain databanks for research purposes, particularly in the health sector. This committee is one of the initiatives being launched to provide Quebecers with a more open government.

Mandate and timeline

Under its mandate, the committee must:

- Evaluate how Institut de la statistique du Québec can improve the services it offers by providing access to data
- Determine what resources are required to optimize the access procedure
- Determine the legislative and regulatory changes required
- Ensure privacy

The committee will be coordinated by Ministère des Finances du Québec (MFQ).

It will be composed of representatives from MSSS, MESI, Institut de la statistique du Québec, Régie de l'assurance maladie du Québec, Commission d'accès à l'information, and Secrétariat à l'accès à l'information et à la réforme des institutions démocratiques.

Consultations may be held to collect suggestions from those concerned. Suggestions could be regarding the security measures required to ensure privacy is protected.

The committee must complete its work and make recommendations to the government by fall 2017.

1.3 FINANCIAL FRAMEWORK

For 2017–2022, \$95 million is earmarked for the first objective of the Québec Life Sciences Strategy, including \$86 million in new money.

TABLE 1

Increase Investment in Research and Innovation in All Life Sciences

(in millions of dollars)

| | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | Existing budget | New money | TOTAL |
|--|------------|-------------|-------------|-------------|-------------|-------------|-----------------|-------------|-------------|
| Increase investment in research and innovation in all life sciences | | | | | | | | | |
| 1.1 Risk-sharing in research and innovation | 2.6 | 10.4 | 17.9 | 17.9 | 17.9 | 17.9 | 9.0 | 75.0 | 84.0 |
| 1.2 Upgrade of health and social services network assets | 1.5 | 2.6 | 2.3 | 2.3 | 1.2 | 1.2 | 0.0 | 11.1 | 11.1 |
| Total existing budget | – | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 9.0 | – | |
| Total new money – Québec Economic Plan – March 2016 | 2.1 | 2.2 | 1.7 | 1.7 | 0.6 | – | – | 8.3 | |
| Total new budget – Québec Economic Plan – March 2017 | 2.0 | 9.0 | 16.7 | 16.7 | 16.7 | 16.7 | – | 77.8 | |
| TOTAL | 4.1 | 13.0 | 20.2 | 20.2 | 19.1 | 18.5 | 9.0 | 86.1 | 95.1 |

Note: Figures are rounded to the first decimal. The total is the reference.

FOR 2017–2022, \$95 MILLION IS EARMARKED FOR THE FIRST OBJECTIVE OF THE QUÉBEC LIFE SCIENCES STRATEGY, INCLUDING \$86 MILLION IN NEW MONEY.



Source: Shutterstock

INNOVATION
COMES TO LIFE

GROWTH



FOSTER THE
CREATION OF
INNOVATIVE
COMPANIES AND
ENSURE THEIR
GROWTH

2

FOSTER THE CREATION OF INNOVATIVE COMPANIES AND ENSURE THEIR GROWTH

The government's second objective is to foster the creation and growth of innovative companies in the life sciences sector by strengthening certain critical phases of business funding, specifically:

- Promoting the seeding and startup of new businesses
- Contributing to the development of successful companies
- Fostering the emergence of new Québec flagships

The challenge: Capitalizing on discoveries

One of the major challenges of the life sciences sector is capitalizing on discoveries to create economic and industrial spinoffs.

The life sciences sector has its own peculiarities in terms of product development, which entails high costs, can take a long time, and involves significant risks inherent to science and commercialization. To capitalize on discoveries, investors must overcome various hurdles and find the funding they need.

Québec's financial ecosystem has grown stronger in recent years. However, improvements are still needed to strengthen certain stages and ensure that funding is available for certain subsectors, particularly medical technology.

SELECTED TARGETS

The second objective of the Québec Life Sciences Strategy is aimed at the following targets:

- Support the startup and growth of 40 companies through measures carried out by 2022
- Support the growth of up to five flagships by 2027

2.1 SEEDING AND STARTUP OF COMPANIES

The government's first step will be to strengthen the seeding and startup of life sciences companies through a series of initiatives:

- Technology maturation and transfer
- Business incubation
- Availability of seed funds
- Commercialization of certain products and services

Technology maturation and transfer

To take full advantage of discoveries in basic research primarily from higher education institutions, the funding chain leading to the creation and development of new businesses must be complete. To ensure this, the Québec government supports development corporations. This facilitates the transition from discovery to commercialization for innovations emanating from universities.

In the drug industry, transition is more complex and costly. The government therefore intends to further support the main stakeholders in drug development. To this end, it is announcing that certain aid parameters will be revised to ensure they are better adapted to the realities of drug development.

Additional \$10 million for technology maturation projects

The government will earmark an additional \$10 million over the next five years to support technology maturation projects under the Technology Development and Transfer Support Program.

The goal is to accelerate technology maturation and transfer by increasing the number of technology transfer projects in the field of drug discovery.

The measure will lead to better commercialization of research, new business startups, and the development of new technology in collaboration with existing companies. The program rules will allow more drug discovery players to qualify for support.

This additional funding will help overcome the frequent challenge of developing the new technologies enough to make them attractive, particularly to venture capitalists.

Ce financement additionnel permettra de surmonter, dans de nombreux cas, la difficulté à valoriser suffisamment les technologies pour les rendre attrayantes, notamment auprès des sociétés de capitaux de risque.

Incubation vouchers

In the early development stages of a life sciences innovation, researchers or entrepreneurs must sometimes call on specialized expertise, particularly to draw up development plans able to attract private investors.

An additional \$2.2 million to broaden and enhance incubation vouchers

To address this issue, the government is broadening the scope of incubation vouchers and adding \$2.2 million over five years under the Technology Development and Transfer Support Program.

This will accelerate startup for life sciences companies with special business or commercialization management needs. Incubation vouchers will support the startup of innovative technology companies with strong growth potential in the life sciences sector.

This support will enable promising, better-structured projects to be presented to potential investors, such as angel investors and venture capitalists.

Over time, these efforts will make selected businesses more competitive and set them on the path to success.

New AmorChem II seed fund

In the March 2016 Economic Plan, the Québec government announced the introduction of the new AmorChem II seed fund.

This fund will be used to finance promising projects in the life sciences sector emanating from Québec universities and research centers.

Objectives

The objectives of the AmorChem II seed fund are as follows:

- Make new investments in projects from Québec universities or research centers in the life sciences
- Support the creation of businesses in the life sciences
- Maintain technology license framework agreements and research contracts with the main Québec research centers and universities

Providing funding for innovations in the early stages

The lack of funding to support the early development stages of life sciences innovations is an issue in both Québec and around the world.

Seeding is the investment stage that attracts the fewest private investors due to the high risk level and the intensive, specialized support that is required. Most venture capital investments are made in the startup and post-startup stages in Québec.¹⁵

It is therefore essential that the government maintain its efforts in partnership with the private sector to finance technology companies in the seeding stage.

The existence of high quality projects in the seeding stage will ensure that investors active in Québec have access to projects with strong growth potential in the more advanced business development stages.

A fund for marketing high-value-added products and services

The government wishes to participate in setting up a fund for marketing value-added products and services, in partnership with larger companies that take part in developing such innovations.

The goal is to enable Québec to take full advantage of investments made earlier in the innovation chain, particularly by research consortiums like CQDM. The government's involvement will be specified later.

Sharing innovation chain risks

Developing a successful innovation ecosystem is one of the keys to the emergence of innovative Québec companies that stand out from international competition.

By sharing the risks in research and innovation with the private sector earlier in the innovation chain, the government can contribute to the recognition and support of promising projects.

Participation by large companies helps not only to select the best projects, but also to make the right choices to ensure optimal development of these projects.

Four sectors

The fund will be reserved for life sciences companies in the following four sectors:

- Development of innovative drugs
- Drug delivery technology
- Diagnostic tests and medical devices
- Specialized biopharmaceutical research services

Government investments will be in the form of a matching system, i.e., the government will provide one dollar for every dollar invested by large life sciences companies. They will also be conditional on compliance with certain criteria specified by the government:

- Minimum capitalization of \$10 million
- A financial model that complies with best business practices
- Participation by investors who have good knowledge of the life sciences ecosystem in the early stages of innovations in this field
- A project selection and management team that has an entrepreneurial performance history in the sectors concerned
- Proficiency in the business investment process and good governance

This new fund will encourage private investors to participate in funding the early stages of life sciences innovations and will help leverage assets funded in Québec.

15. Government of Québec, *Québec Economic Plan – March 2016*, p. B215.

OPTIMIZING THE VENTURE CAPITAL FUNDING CHAIN

The venture capital industry is doing well in Québec, thanks mainly to the involvement of Québec venture capital and development capital funds. Various government policies adopted in recent years have also helped structure this industry.

Assessment of the government's intervention method

In an ever-changing environment, assessing the government's intervention method with regard to investment capital is key to sustaining the funding ecosystem of capital investment companies and optimizing economic spinoffs in Québec.

Knowing this, the government recently commissioned a study on Québec's public capital investment policies.

Venture capital funding chain in the life sciences sector

The venture capital funding chains of companies in the life sciences sector will be studied in connection with the innovation chain.

The conclusions will be taken into account when certain measures announced in this Strategy are implemented.



Source: Shutterstock



Source: Atlasciences

2.2 DEVELOPMENT OF SUCCESSFUL COMPANIES

Second, in addition to support for business seeding and startup, the Québec Life Sciences Strategy includes a series of measures that seek to support the development of successful companies by:

- Increasing the availability of specialized facilities and assisting entrepreneurs
- Showcasing the expertise of high-value-added Québec service companies
- Encouraging export to new markets
- Raising awareness of assistance programs available to Québec SMEs in the sector

Availability of specialized facilities and support for entrepreneurs

The availability of specialized facilities and support for entrepreneurs are key conditions for fostering the development of successful life sciences companies.

In 2013, the government supported the NEOMED project. More recently, the Sherbrooke Science Park announced the launch of EspaceLabz. Such spaces enable companies to have access to specialized facilities, but above all to create environments that foster collaboration and synergy.

The medical technology sector can count on the support of Campus des technologies de la santé (CTS) in Montréal. The CTS mission is to ensure the development and sustainable growth of promising enterprises in the medical technologies sector and to enhance their national and international exposure.¹⁶

Entrepreneurs also have access to many mentoring and support initiatives. Montréal InVivo has set up the Mentorat bioSuccès mentoring network. Québec International and Sherbrooke Innopole also offer support services for technology companies.

Supporting local initiatives

The government confirms its intention to support local initiatives to stimulate and support entrepreneurship. It will use existing programs for this purpose.

16. ctssante.com/en/

ESPACE LABZ IN SHERBROOKE AND NEOMED IN MONTRÉAL AND LAVAL

Espace LABZ

EspaceLabz is a multitenant complex in Sherbrooke that will serve as a home for life sciences startups. This new building will make lab space, non-existent up to now, available outside the university campus. Tenant companies will be able to enjoy state-of-the-art facilities that include both private and common laboratory equipment and space.

This complex is near key research and business players active in this industry, such as Centre de recherche du Centre hospitalier de l'Université de Sherbrooke, the Pharmacology Institute of Sherbrooke, and Charles River Laboratories.

EspaceLabz will thus provide life sciences entrepreneurs in the Eastern Townships with the opportunity to develop their companies in Sherbrooke. The project represents a \$5.5 million investment. It will create some 60 jobs over a five-year period.

NEOMED Institute

The NEOMED Institute consists of two high-tech research and development facilities with shared common spaces. It houses independent businesses whose proximity promotes collaboration, innovation, and creativity. Since it opened, 26 companies and organizations employing over 290 people have moved into the two facilities.

- The first facility, located on Technoparc Montréal's Saint-Laurent Campus, is dedicated to the development of small molecule therapeutics. It is home to NEOMED R&D, which operates like a traditional biotech, working on its own new drug development projects.
- The second facility, located in Laval, specializes in the development of biologics and vaccines. It is home to NEOMED-LABS, a contract research organization specializing in clinical immunology for the development of new vaccines and biological molecules.

Sources: NEOMED Institute and Sherbrooke Innopole

GOVERNMENT ENTREPRENEURSHIP ACTION PLAN (2017–2022)

The Government Entrepreneurship Action Plan (2017–2022) will set out entrepreneurship services available in Québec. It will coordinate government action while offering concrete new measures to address current concerns.

The actions identified in the plan will address six main objectives:

- Promote entrepreneurship and develop entrepreneurial skills
- Boost the number of entrepreneurs, particularly among youth, women, and immigrants
- Foster high-tech entrepreneurship and new forms of support, e.g., incubators and accelerators
- Encourage networking and mentoring as well as technical and financial coaching
- Ensure access to various funding sources all along the business development chain
- Facilitate the transfer of businesses to future generations

Showcasing the expertise of high-value-added Québec service companies

Using the services of third parties for research, development, and manufacturing is becoming more common in the pharmaceutical industry.

It is therefore essential that Québec companies have opportunities to benefit from this business model. The expertise they offer is often little known, even locally.

To take advantage of this high-growth-potential industry, they need to tell the world what they can do.

Government investment in greater visibility for service companies

With the collaboration of leading industrial associations, the government is investing in heightened visibility for a cluster of high-value-added service companies in Québec.

This will take the form of a directory of Québec R&D and contract manufacturing organizations, which will be sent directly to potential Québec or foreign clients electronically or distributed during trade missions.

Support will also be provided for networking activities in Québec between service companies and potential clients, i.e., biotech companies, private equity funds, or large companies.

The \$50,000 cost of the initiative over five years will be funded from the MESI budget.

Goal

Showcasing the expertise of high-value-added Québec service companies will increase the revenue and market share of Québec-based businesses and create jobs.

Ultimately the goal is to foster the emergence of Québec flagships in the research, development, and manufacturing services sector and position Québec as a strategic innovation partner in life sciences.



Source: Altasciences

**IT IS THEREFORE ESSENTIAL
THAT QUÉBEC COMPANIES
HAVE OPPORTUNITIES
TO BENEFIT FROM THIS
BUSINESS MODEL.**

HIGH-VALUE-ADDED LIFE SCIENCES SERVICES

Québec boasts 87 companies that offer research, development, and manufacturing services. These companies number about 7,000 employees, or nearly 25% of the jobs in Québec's life sciences industry in 2016.

Contract research and development

KPMG¹⁷ estimates that the compound annual growth rate of the global R&D services market was higher than that of the domestic R&D market between 2013 and 2017, i.e., 6.6% compared to 2%.

Contract research organizations in Québec reported in 2014 and 2016 that over 85%¹⁸ of their contracts came from outside Québec.

KPMG estimates that the revenue from contracts carried out in Québec by contract R&D companies totaled \$550 million in 2015.

Meanwhile, the closure of research centers in Québec in recent years has led to the creation of many contract R&D organizations by former employees of large biopharmaceutical companies. These firms have developed niche expertise that is key to innovation development.

Contract manufacturing

Nearly 50% of biopharmaceutical companies now outsource the manufacture of their products.

Québec has contract manufacturing organizations whose specialized expertise sets them apart out from large-scale manufacturers.

17. *Portrait des organisations de recherche contractuelle actives au Québec*, KPMG, January 2016.

18. Data from the 2014 and 2016 census records of Ministère de l'Économie, de la Science et de l'Innovation.



Source: Altasciences



Source: Altasciences



Export to new markets

The Export Québec export program supports companies that wish to expand and diversify their export markets. It provides support for international outreach, particularly by helping companies get the international certifications they may require.

To accelerate diversification of Québec life sciences companies, MESI will increase the support it provides companies in the sector.

Promoting government programs to life sciences SMEs

Many existing government programs could prove useful to life sciences SMEs in developing innovations.

What's more, many of these programs fall under MESI's jurisdiction. They provide many millions of dollars in support annually and can help life sciences companies develop innovations in house or in the form of research partnerships with public agencies or for investment projects.

To better promote the resources available, the government intends to:

- List Québec assistance programs available to life sciences companies on the Entreprises Québec website (www.entreprises.gouv.qc.ca/) to make them easier to find
- Make the life sciences sector aware of these programs

Promoting these programs will raise awareness of available resources in life sciences and the programs that people can draw on for their business or health research projects. Information on available public facilities and equipment will also be included. This will make it possible for entrepreneurs to take full advantage of the services the Québec government has to offer.

The \$50,000 cost of the initiative over five years will be funded from the MESI budget.

Source: GenePOC

2.3 THE EMERGENCE OF NEW QUÉBEC FLAGSHIPS

Support for the creation and growth of innovative life sciences companies involves a third component dedicated to the emergence of new Québec flagships.

Once they have overcome funding challenges in the early development stages, life sciences companies face financing issues in later stages. When they are unable to find the money they need to fund growth and development in Québec, they often opt to sell their innovations to big international players.

To support innovative life sciences companies that have already gone through the early stages of their development and promote the emergence of new Québec flagships, the government will draw on four measures:

- The BioMed Propulsion program
- A strategy geared toward specialized investors in medical technology
- Financial Initiatives Group
- Identification of ways to ensure access to stock markets



Source: GenePOC

\$100 million for equity loans: The BioMed Propulsion program

To support Québec companies in these critical stages of their growth and ensure they take root in Québec, the government announced in the March 2016 Economic Plan the introduction of the BioMed Propulsion program, a \$100 million equity loan program. It is modeled on the Bio-Levier program launched in 2002.

The BioMed Propulsion program is designed for human health biotechnology companies that have reached the clinical stage or medical technology or animal health biotechnology companies that have received approval from at least one regulatory agency. There are minimum and maximum thresholds for financial assistance:

- \$2.5 million and \$10 million for biotechnology companies
- \$500,000 and \$10 million for medical technology companies

Companies must raise new funds from private investors in the form of share capital or shares that represent three times the amount of financial support requested.

Objectives

The government is pursuing the following objectives under the BioMed Propulsion program:

- Improve access to funding for life sciences companies
- Foster the development and maintenance of companies with strong growth potential
- Support product development
- Contribute to the creation and maintenance of sustainable, good quality jobs
- Support R&D investment for biotechnology companies
- Provide an additional source of investment in support of medical technology commercialization efforts



Source: Medicago

THE BIO-LEVIER PROGRAM AND ITS RESULTS

This leveraged loan program, announced in 2002, matched funding from outside investors in the form of a loan. The program was designed for companies in the growth phase, i.e., those that had passed the startup phase.

The Bio-Levier program provided support to nine businesses.

Tangible results

Although health sciences is a high-risk sector, three companies that received support reported significant economic and financial results.

Two of the companies, Medicago and Cryocath (acquired by Medtronic), are continuing to grow at a good pace in Québec and are spearheading major investment and job creation projects.

- Cryocath was acquired by Medtronic for \$400 million and today boasts over 700 employees at its R&D center and manufacturing plant and on its medical training team in Montréal.
- In 2015 Medicago announced an investment of \$245 million and the creation of 200 new jobs in Québec City. Following its investment, the company will number over 380 employees.

The third company, Gemin X, was acquired for \$225 million. This enabled many public and private investors to earn attractive returns and reinvest in the sector in Québec.

A strategy geared toward specialized investors in medical technology

Medical technology companies in Québec have access to public research and innovation funds, from the time ideas are launched until proof of concept.

However, they have difficulty finding funding when they enter the critical growth phase, just prior to commercialization. The money raised at this phase often results in reduced shareholder control or earnings per share, and this type of capital is rare in Québec.

Considerable decrease in investment since 2003

According to a study conducted in November 2011,¹⁹ a venture capital investment flow analysis revealed that since 2003, investment in medical technology in Québec had decreased considerably.

There has been almost no new investment in this sector in Québec since 2006. The scarcity of capital at this stage and for this sector is due largely to the fact that expertise in medical technology funding is almost non-existent in Québec.

19. This study was funded by Ministère du Développement économique, de l'Innovation et de l'Exportation.

Assessment of possible solutions

The government intends to develop a targeted strategy to deal with this issue.

It will assess various financing solutions, i.e., the creation of a fund reserved for this specialized sector in partnership with the private sector or through other initiatives that can respond to the needs expressed by the industry.

The goal is to attract experts in this field and specialized investors to Québec to support the development of larger medical technology companies in the province.

Financial Initiatives Group

Last February the government announced the introduction of Financial Initiatives Group under the Plan to Strengthen the Québec Economy as an Executive-Driven Economy.²⁰ The goal is to have all the expertise and information required to prevent the risk of head offices of major companies relocating and the ownership of Québec companies being transferred. The government also wishes to be in position to meet the financing needs of the most promising companies experiencing growth.

Financial Initiatives Group will consist of representatives of Investissement Québec, tax-advantaged funds, Québec public funds, and the financial sector, including the banking and cooperative sectors. Its first task will be to circulate findings and analyses among major Québec investors on factors that can affect the location of head offices and the ownership of Québec businesses. It will also determine the best ways to support flagship companies in their development.

Experts dedicated to the life sciences sector

The government will call on the services of life sciences experts to support Financial Initiatives Group. The issue entrusted to the Group has a particular impact on the life sciences sector.

Québec has been the birthplace of companies that have been very successful financially and in terms of therapeutic innovation in the medical technology, biopharmaceutical, and service sectors. Examples include Enobia, Gemin X, Axcan Pharma, ViroChem, Anapharm, and Paladin.

However, almost all these promising companies have been subsequently acquired by foreign interests. Such acquisitions require major investments and specialized knowledge. Although Québec has many public and private investors, their abilities are sometimes limited when it comes to investing large sums, and returns on investment sometimes take longer than in other sectors. The life sciences sector requires highly specialized investors who understand both the science and the financial risks inherent to these companies.

Experts' mandate

The experts selected will provide ongoing market intelligence to identify opportunities for investment in Québec life sciences companies. Using their know-how and network of international contacts, they will advise the government on how best to offer financing that meets the financial needs of companies in the sector.

The experts will also be tasked with finding possible solutions to developing Québec flagships with strong potential in the sector.

Access to stock markets

Access to stock markets is an attractive option for ensuring the growth of a business.

Right now, NASDAQ in New York is the best option for highly innovative life sciences companies that want to make an initial public offering. The Toronto Stock Exchange (TSX) is often incapable of getting them adequate funding.

To prevent initial public offerings on NASDAQ from leading to the relocation of companies to the United States, the government is taking two key actions:

- The first is a study to identify which conditions are conducive to companies remaining in Québec following initial public offerings on NASDAQ. The study may lead to a review and alignment of the required regulatory documents, to facilitate initial public offerings on NASDAQ.
- The second is identifying the changes that need to be made to the TSX to allow adequate funding of life sciences technology companies.

The \$100,000 cost of these measures will be funded from the MESI budget.

20. *For an open and prosperous economy – A Plan to Strengthen the Québec Economy as an Executive-Driven Economy*, Québec City, February 2017, p. 82.



NASDAQ AND THE RISK OF EXPERTISE GOING TO THE UNITED STATES

According to a study funded by MESI in 2014,²¹ the Toronto Stock Exchange (TSX) is unable to secure adequate funding for life sciences companies to continue developing independently in Québec.

This is due to a lack of liquidity and specialized investors and to the small number of analysts who have the knowledge required to analyze this sector. For these companies, NASDAQ is a better short-term option.

A risk of gradual relocation, but the outlook is positive

Frequently a company will open an office in the United States to bring in the expertise it lacks to trade on public markets and will move certain functions there.

Second, to make the company more attractive to U.S. investors during the initial public offering, the management team is subsequently replaced by an American team with experience in managing public companies for the more advanced phases of product development and for commercialization. The company will often move its head office to the United States and keep a Canadian branch open to conduct certain R&D activities.

However, awareness of Canada has grown among specialized U.S. investors in recent years, and they require less and less often that companies be established in the United States before they invest in them.

Companies that are the exception

The situation is, however, very different for specialty pharmaceutical companies and service companies (clinical research services) that quickly generate revenue and profits and do not run the same type of technological risk.

Many of these companies have made successful public offerings on the TSX in recent years.

Source: Kinova Robotics

21. *Développer des entreprises indépendantes dans le secteur des sciences de la vie et des technologies médicales au Québec*, Montréal InVivo, September 2014.

2.4 FINANCIAL FRAMEWORK

For 2017–2022, \$49 million is earmarked for the second objective of the Québec Life Sciences Strategy, including \$37.2 million in new money starting in 2017–2018.

TABLE 2

Foster the Creation of Innovative Companies and Ensure Their Growth

(in millions of dollars)

| | 2016- 2017 | 2017- 2018 | 2018- 2019 | 2019- 2020 | 2020- 2021 | 2021- 2022 | Existing budget | New money | TOTAL |
|--|---------------|---------------|---------------|---------------|---------------|---------------|--------------------|--------------|-------------|
| Foster the creation of innovative companies and ensure their growth | | | | | | | | | |
| 2.1 Seeding and startup of companies | – | 4.4 | 4.7 | 4.8 | 4.8 | 4.8 | 11.2 | 12.2 | 23.4 |
| 2.2 Development of successful companies | – | 0.0 | 0.2 | 0.1 | 0.1 | – | 0.4 | – | 0.4 |
| 2.3 The emergence of new Québec flagships | – | 10.0 | 10.1 | 5.0 | 0.0 | 0.0 | 0.2 | 25.0 | 25.2 |
| Total existing budget | – | 2.2 | 2.5 | 2.4 | 2.4 | 2.3 | 11.8 | – | – |
| Total new money – Québec Economic Plan – March 2016 | – | 10.0 | 10.0 | 5.0 | – | – | – | 25.0 | – |
| Total new budget – Québec Economic Plan – March 2017 | – | 2.2 | 2.5 | 2.5 | 2.5 | 2.5 | – | 12.2 | – |
| TOTAL | – | 14.4 | 15.0 | 9.9 | 4.9 | 4.8 | 11.8 | 37.2 | 49.0 |

Note: Figures are rounded to the first decimal. The total is the reference

INNOVATION
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INVESTMENT

3

ATTRACT NEW PRIVATE INVESTMENT

Growth in the life sciences sector requires more than a strong local industry. It also requires new private investment, particularly investment from out of province or abroad.

Foreign companies invest billions of dollars throughout the world each year. Québec must showcase its talent and appeal to get a greater share of those investments.

It must also demonstrate how competitive it is. Québec is the place in North America where average researcher salaries and the operating and facility costs of life sciences companies are the lowest.²²

The government's third objective is to attract new private investment in the life sciences sector by:

- Coordinating private investment prospecting efforts
- Ensuring the Québec life sciences sector is promoted abroad

SELECTED TARGETS

The third objective of the Québec Life Sciences Strategy is aimed at the following targets:

- **Attract and support private industrial projects worth over \$500 million by 2022**
- **Attract at least one major local biomanufacturing project by 2022**
- **Conduct five key-player hosting events per year that lead to at least 10 collaboration or investment projects by 2022**

3.1 PRIVATE INVESTMENT PROSPECTING

To attract new private investment in the life sciences sector, the government is implementing two new initiatives:

- A collaborative life sciences investment prospecting unit
- Support for major investment projects under the ESSOR program

A collaborative life sciences investment prospecting unit

Investment prospecting is crucial to the future development of the sector in Québec.

In the life sciences sector, Québec must be able to offer a complete ecosystem within its limits, from research to commercial production, and all the development stages in between. It must therefore attract more private investment projects to supplement what is already on the table. Recognized, fully developed sectors will also enable Québec companies to develop and position themselves internationally.

The government is announcing the implementation of a collaborative life sciences investment prospecting unit. This unit will consist of representatives from Investissement Québec, Montréal International, Québec International, and Sherbrooke Innopole. It will be coordinated by MESI.

Mandate

The investment prospecting unit's mandate is to optimize investment prospecting efforts in the life sciences and health technology sector and targeted niches, including biomanufacturing.

Its work will also seek to maximize the investment benefits of Québec's presence at the BIO trade show, AdvaMed's MedTech Conference, and the World Economic Forum in Davos.

The unit will have a budget of \$50,000 over five years to carry out business intelligence to guide its strategic direction.



Source: Green Cross Biotherapeutics

**THE GOVERNMENT IS
ANNOUNCING THE
IMPLEMENTATION OF A
COLLABORATIVE LIFE
SCIENCES INVESTMENT
PROSPECTING UNIT.**

KEY PLAYERS FOR ATTRACTING INVESTMENT TO QUÉBEC

Investissement Québec

Investissement Québec is a public corporation that reports to the Minister of the Economy, Science and Innovation. Its mission is to foster the growth of investment in Québec and thereby contribute to economic development and job creation in every region.

Investissement Québec provides companies with a complete range of financial solutions—loans, loan guarantees, and share capital investments—to support them at every stage of their development.

It is also responsible for the administration of tax measures and for investment prospecting abroad. Investissement Québec oversees prospecting of new investors not already established in Québec and new investment in the subsidiaries of foreign companies already established in the province.

Montréal International

Montréal International's mission is to act as an economic driver for Greater Montréal to attract foreign wealth while accelerating the success of its partners and clients.

Its mandate is to attract foreign investment, international organizations, and strategic talent to the metropolitan area and promote the competitive business environment of Greater Montréal.

Québec International

Québec International is an economic development agency serving the Québec City metropolitan area. Its mission is to promote the competitive environment of the Québec City area; attract foreign investment and qualified foreign workers; support high tech entrepreneurship, innovation, commercialization, and export; and ensure the development of centers of excellence.

Sherbrooke Innopole

Sherbrooke Innopole is an economic development agency whose mission is to foster innovative, harmonious, and dynamic economic growth by seeking to promote the development of companies created from Sherbrooke ingenuity and research, attracting new companies, and supporting existing companies in their expansion, innovation, and internationalization efforts.



\$100 million in support for major investment projects under the ESSOR program

Over the next five years, the government plans to carry out measures totaling \$100 million through the ESSOR program to support major investment projects in the life sciences sector.

The budget impact for this period is estimated to be \$31 million.

The goal of the ESSOR program is to support investment projects in Québec to increase competitiveness, create employment, and contribute to sustainable development.

Expected result: \$500 million in private investment

Based on the history of financial assistance granted in recent years, the \$100 million set aside for this purpose is expected to lead to the completion of private investment projects worth at least \$500 million.

It will enable the Québec government to act quickly to attract certain desired investments based on opportunities identified through prospecting efforts.

In addition to this support, manufacturing projects worth over \$100 million may also benefit from a tax holiday for large investment projects.

Carrying out these projects in Québec will also serve to:²³

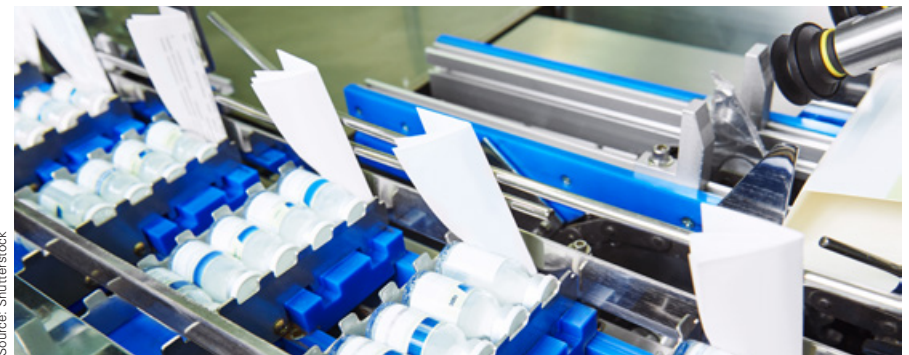
- Develop complete industrial sectors in innovative niches
- Create high-value-added jobs
- Ensure the growth of innovative manufacturing in Québec

Targeting biomanufacturing

The government will target biomanufacturing in particular, an expanding technology sector that is part of the Innovative Manufacturing Initiative.

The government's goal is to:

- Provide a missing link in biologics development in Canada
- Strengthen biomanufacturing in Québec
- Position Québec as a Canadian leader in biomanufacturing
- Diversify the manufacturing services available in Québec's life sciences sector



23. www.finances.gouv.qc.ca/en/Tax_measures_financial_sector_and_enterprises524.asp



INNOVATIVE MANUFACTURING AND BIOLOGICS MANUFACTURING

Innovative manufacturing

To further support Québec companies in their manufacturing innovation and modernization projects, in September 2016 the government announced the launch of its Manufacturing Initiative.

It is designed to help manufacturing companies meet their four main challenges: labor, product innovation, process innovation, and exports.

In connection with this initiative, the Québec Economic Plan – March 2017 provides an additional \$125 million for the innovative manufacturing sector

Biologics manufacturing

The life sciences sector requires the use of highly specialized and innovative manufacturing techniques and is therefore part of the Manufacturing Initiative. To remain at the forefront, Québec must attract investment in sectors of the future, such as biologics manufacturing.

Biologics are therapeutic products (drugs) or vaccines consisting of very large complex molecules. Biologics are much more complex to manufacture than chemical molecules. They must be manufactured in living systems such as bacterial cultures or plant or animal cells. This manufacturing process is called “biomanufacturing” or “biologics manufacturing.”

Biologics represents about 20% of the pharmaceutical market and holds a growing share of the market. Sales of these types of products totaled \$200 billion in 2014.²⁴

Source: Bio-K + International

24. Niceinsight.com, “Biologics Development Continues to Rise,” and Pharmtech.com, “The Global Manufacturing Outsourcing Market.”

3.2 PROMOTING QUÉBEC'S LIFE SCIENCES SECTOR

In its ongoing effort to attract new private investment, the government is putting money into promoting Québec's life sciences sector by:

- Hosting key players of the pharmaceutical and medical technology industries
- Supporting the establishment of a coordination network to promote the sector and its projects
- Promoting the life sciences sector at international trade shows

Hosting key players of the pharmaceutical and medical technology industries

Large pharmaceutical and medical technology companies are constantly on the lookout for innovations and investment opportunities. They have teams that travel the world to find investment or research partnership opportunities or promising projects to incorporate into their business activities. Québec must attract the attention of these prospecting teams and be ready to host representatives of companies that want to invest.

Prospecting visits abroad organized by economic development organizations, or trade missions sponsored by the Québec government, are great opportunities to get international decision makers to visit Québec.

In all cases, it is essential to choose the right players and present them with the best possible business opportunities. This is key if we want to develop profitable long term business relationships and ensure long term benefits for Québec.

A targeting and hosting process

To maximize the impact of these visits, the Québec government is setting up a targeting and hosting process for key players in major international corporations, in collaboration with the organizations concerned.

In Québec, many organizations assist in hosting these visitors, including economic development organizations, Montréal InVivo (life sciences and health technologies cluster), development companies, research organizations, and MESI.

This will:

- Maximize the benefits for Québec
- Raise awareness of innovations emanating from research centers or companies
- Attract more investment and partnerships between big companies and Québec research centers
- Raise the profile of Québec's life sciences sector internationally

**LARGE PHARMACEUTICAL
AND MEDICAL TECHNOLOGY
COMPANIES ARE CONSTANTLY
ON THE LOOKOUT FOR INNOVATIONS
AND INVESTMENT OPPORTUNITIES.**

INTERNATIONAL COLLABORATIONS AND PARTNERSHIPS

Sharing knowledge on a global scale is now key to the advancement of science and society. Successful international collaborations promise better access to knowledge and updated technology and processes that enable industries to remain competitive.

For Québec, these collaborations contribute to the scientific progress of researchers, the reputation of organizations, and the growth of companies. They also strengthen Québec's ability to act and exert influence on the world stage.

Examples

In recent years many organizations and associations in Québec's life sciences sector have developed multiple industrial, scientific, and organizational partnerships and collaborations with other provinces, states, and countries, including Ontario, Alberta, Massachusetts, France, and certain provinces in China.

Examples include:

- CQDM's Explore program geared toward the scientific community in Québec and Ontario, to carry out research projects
- The collaboration between BIOQuébec and MassBio to strengthen their industrial and scientific ties
- CHU Sainte-Justine's projects abroad, which seek to export its expertise in the management and organization of mother and child hospital care

SUCCESSFUL INTERNATIONAL COLLABORATIONS PROMISE BETTER ACCESS TO KNOWLEDGE AND UPDATED TECHNOLOGY AND PROCESSES THAT ENABLE INDUSTRIES TO REMAIN COMPETITIVE.



Support from the coordination network for promoting the sector and its projects

The government is confirming its support for the establishment of a coordination network to promote the life sciences sector and its projects.

The network was officially launched in 2016. Its mission is to ensure better consistency in promoting Québec in the life sciences sector, mainly abroad.

An executive committee

An executive committee was created to ensure the representativeness of the sector's ecosystem in decision making.

In addition to MESI, as of now the network includes the Canadian Generic Pharmaceutical Association, BIOQuébec, Biotech City, Fonds de recherche du Québec – Santé, Genome Québec, Investissement Québec, MEDEC, Innovative Medicines Canada, Montréal International, Montréal InVivo, Québec International, Sherbrooke Innopole, and representatives of various Québec research centers.

Other partners may join in the future.

The network will be funded in collaboration with public and private partners. Up to \$450,000 over five years has been set aside to carry out this measure. It will be funded from the MESI budget.

Promoting the life sciences sector at international trade shows

BIO trade show

The Québec government will contribute directly to promoting the industry and its assets at the BIO trade show for the next five years.

The BIO International Convention, hosted by the Biotechnology Innovation Organization, is the biggest trade show in the world for the biopharmaceutical sector. Each year it attracts nearly 15,000 attendees from 60 countries.

This trade show is a unique opportunity for Québec to position itself with public research centers and companies to attract major investment and partnership projects.

AdvaMed's MedTech Conference

The Québec government will contribute directly to promoting the medical technology industry and its potential at the MedTech Conference for the next five years.

The MedTech Conference is organized by AdvaMed, the main U.S. trade association dedicated to the medical technology sector. It is the largest gathering of the medical technology industry in North America.

This conference is a unique opportunity for Québec companies to establish key contacts with the sector's U.S. industry leaders and distributors and speak directly to representatives of the U.S. regulatory agency—the Food and Drug Administration—insurance companies, and the financial community.

The \$1.4 million cost of these measures over five years will be funded from the MESI budget.



Source: MESI



EXPORT QUÉBEC AND THE 2016–2020 QUÉBEC EXPORT STRATEGY

In addition to the BIO trade show and the MedTech Conference, Export Québec will have an annual program of 10 other life sciences events based on priorities identified by the industry and industry associations.

Technology showcases

Under the 2016–2020 Québec Export Strategy, the Québec government supports the establishment of technology showcases through the Créativité Québec program, administered by Investissement Québec.

This measure, which was eagerly awaited by the life sciences industry, will further support the development of Québec technology internationally, backed by a \$6 million budget.

Knowledge of the export markets

The Québec Export Strategy also covers activities organized by Export Québec to promote knowledge of the various export markets and the pursuit of business opportunities outside Québec. These activities apply to life sciences companies.



Only available in French

3.3 FINANCIAL FRAMEWORK

For 2017–2022, \$33 million is earmarked for the third objective of the Québec Life Sciences Strategy, all from existing budgets

TABLE 3

Attract New Private Investment

(in millions of dollars)

| | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | Existing budget | New money | TOTAL |
|--|-----------|------------|------------|------------|------------|------------|-----------------|-----------|-------------|
| Attract new private investment | | | | | | | | | |
| 3.1 Private investment prospecting | – | 3.8 | 5.7 | 6.5 | 7.5 | 7.5 | 31.0 | – | 31.0 |
| 3.2 Promoting Québec’s life sciences sector | – | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 1.9 | – | 1.9 |
| Total existing budget | – | 4.1 | 6.1 | 6.9 | 7.9 | 7.9 | 32.9 | – | |
| Total new money – Québec Economic Plan – March 2016 | – | – | – | – | – | – | – | – | |
| Total new budget – Québec Economic Plan – March 2017 | – | – | – | – | – | – | – | – | |
| TOTAL | – | 4.1 | 6.1 | 6.9 | 7.9 | 7.9 | 32.9 | – | 32.9 |

Note: Figures are rounded to the first decimal. The total is the reference.

INNOVATION
COMES TO LIFE

INTEGRATION



FURTHER INTEGRATE
INNOVATION INTO THE
HEALTH AND SOCIAL
SERVICES NETWORK

4

FURTHER INTEGRATE INNOVATION INTO THE HEALTH AND SOCIAL SERVICES NETWORK

The government's fourth objective is to better integrate innovation into the health and social services network so that all of Québec can benefit from innovations, wherever they may be developed, and the network's future sustainability can be ensured.

To this end, the government is announcing:

- The establishment of Health and Social Services Innovation Office (Bureau de l'innovation en santé et en services sociaux)
- The formation of a working group to facilitate access to government contracts
- Support for real-world evidence projects
- Faster access to drugs

SELECTED TARGETS

The fourth objective of the Québec Life Sciences Strategy is aimed at the following targets:

- Present an average of five technology showcases per year over the next five years
- Conduct an average of 12 real-world evidence projects per year between 2018 and 2022
- Synchronize the listing recommendations of Institut national d'excellence en santé et en services sociaux (INESSS) and the Canadian Agency for Drugs and Technologies in Health (CADTH) so that the average interval between them is a maximum of one month
- Each year, have started the review of at least five drugs by INESSS prior to the delivery of a notice of compliance by Health Canada
- Reduce the time between the delivery of a notice of compliance by Health Canada and reimbursement by the Québec government

Integrating innovations: A challenge for the health and social services network

The number of innovations developed by the industry each year is significant. Some are promising while others have marginal added value.

Knowing which ones to adopt remains a challenge for the health and social services network.

For Québec companies, it is vital that the health and social services network adopt their technology to ensure their growth both in Québec and abroad. The complexity of certain processes, however, makes this difficult.

As the population ages and the incidence of chronic disease increases, healthcare systems around the world must find solutions to be more effective. Integrating innovation must be part of the targeted solutions. However, it must be done in an orderly manner and be based on the needs of the health and social services network.

**AS THE POPULATION AGES AND
THE INCIDENCE OF CHRONIC
DISEASE INCREASES, HEALTHCARE
SYSTEMS AROUND THE WORLD
MUST FIND SOLUTIONS TO
BE MORE EFFECTIVE.**



Source: Medtronic



Source: Kinova Robotics

4.1 CREATION OF THE HEALTH AND SOCIAL SERVICES INNOVATION OFFICE

Integrating innovations into the health and social services network is a complex issue. The multitude of products available, the particularities of how Québec's health and social services network is organized, and the complexity of decision processes complicate decision making.

To address this issue, the government is implementing two initiatives:

- Health and Social Services Innovation Office (HSSIO)
- An optimized process for evaluating innovative healthcare technology

Mandate of HSSIO

The mandate of HSSIO is to integrate innovation into the activities of the health and social services network. This begins by establishing a common vision of innovation.

HSSIO will be established within the MSSS portfolio and report directly to the minister.

Its mandate will be to:

- Define the health and social services network's expectations of the types of innovations to be integrated
- Coordinate the integration of innovations into health and social services in Québec to speed up the adoption of innovations and new technology that are relevant and efficient for the network
- Contribute to Québec's growth and competitiveness in life sciences by demonstrating the effectiveness of selected innovations

HSSIO activities

More specifically, HSSIO must:

- Determine and prioritize the needs of the health and social services network with regard to health and social service innovations and link them to the procurement and assessment processes
- Facilitate the flow of innovation in health and social services by providing promoters of this technology with a service and support office
- Accelerate the introduction of relevant and effective innovative technology, particularly by facilitating the establishment of technology showcases in the health and social services network, and support its optimal rollout based on the network's priorities and for the well-being of patients, while respecting budgetary limitations
- Measure and document the effects of the fast and controlled introduction of innovations on the performance of the health and social services network and its institutions
- Expand the network's expertise in Québec, the rest of Canada, and abroad for the assessment and introduction of innovations and innovative technology in health care
- Report annually to the Minister of Health and Social Services on the work carried out and the results obtained

HSSIO may use calls for solution proposals to address problems identified by the health and social services network.

The government is allocating \$4.5 million over five years to support the establishment of HSSIO.

An optimized process for evaluating innovative healthcare technology

To support HSSIO in fulfilling its mission, the government is announcing the implementation of an optimized process for evaluating innovative healthcare technology.

A unit dedicated to assessing technological innovations will be created at INESSS. It will have a budget of \$4 million over five years.

The unit will establish an optimized and tailored methodology for assessing innovative healthcare technology to ascertain its added value throughout the development cycle of new technology, namely:

- During the R&D phase for certain promising technologies
- Prior to implementation for certain disruptive technologies or technologies that have a major impact
- Following implementation to confirm whether the technology is truly efficient in real life



Source: GenePOC

4.2 ACCESS TO GOVERNMENT CONTRACTS

Each year, the government spends over \$20 billion on public contracts. For companies, these contracts represent an opportunity to grow and acquire new expertise.

Formation of a working group to facilitate access to government procurement

The government is sensitive to the challenges associated with access to Québec's procurement contracts that companies in innovative sectors such as medical technology must face. A working committee will therefore be formed for the healthcare sector.

Committee's mandate

The working committee's mandate will be to analyze the criteria used in tender documents to ensure that they do not hinder competition and that Passeport Entreprises measures are better tailored to this key area.

Passeport Entreprises action plan

In October 2015, the government released the Passeport Entreprises action plan. The plan aims to facilitate access to public contracts for companies and enable more SMEs and startups to win such contracts.

With this action plan, the Québec government wishes to build a real atmosphere of trust in the acquisition process of public agencies and thus create a more competitive and open market to make better acquisitions and to enable companies to become more competitive and boost their performance.

Objectives of the Passeport Entreprises action plan

The Passeport Entreprises action plan has four objectives that govern 24 actions applicable to all government contracts:

- Simplify access to government contracts for companies (13 actions)
- Provide companies with more information (4 actions)
- Improve contracting practices and processes (5 actions)
- Enable companies to seek remedies (2 actions)



Source: iStock photo

4.3 SUPPORT FOR REAL-WORLD EVIDENCE PROJECTS

For innovations to be integrated into the health and social services network, it must be possible to assess them in depth in the actual healthcare process. This is known as “real-world evidence”.

Under the Québec Life Sciences Strategy, the government is providing support for real-world evidence projects by:

- Setting up Health and Social Services Innovation Support Fund (Fonds de soutien à l’innovation en santé et en services sociaux)
- Supporting the Québec–Janssen Innovation Partnership initiative

Health and Social Services Innovation Support Fund (HSSISF)

The clinical and economic value of technology varies from one healthcare system to the next. Real-world evidence may be required to determine the full potential or the limitations of an innovation. Such analysis is essential to decision making.

HSSIO will draw on HSSISF in the performance of its mandate. HSSISF funding will be used to analyze the impacts on clinicians and patients and will thus accelerate adoption of new technology recognized as promising by HSSIO.

The fund will have a budget of \$18 million over the next five years.

Two components

HSSISF will consist of two components:

- The first will be for projects from Québec SMEs that want to test innovations.
- The second will be for organizational innovation projects from hospital research centers that want to test non-commercial innovations.

HSSISF will make it easier to obtain the data required for the commercial or operational implementation of innovations.

A key to integrating innovations

Each year Québec invests significantly in research projects designed to benefit human health. However, granting agencies rarely support innovations beyond the discovery stage.

Very few of these projects have the conclusive data required by INESSS to approve them for use in Québec’s health and social services network.

With HSSISF, this essential condition for integrating innovations into the network will be met.

**WITH HSSISF, THIS ESSENTIAL
CONDITION FOR INTEGRATING
INNOVATIONS INTO THE
NETWORK WILL BE MET.**

HEALTH AND SOCIAL SERVICES NETWORK INITIATIVES TO FOSTER THE INTRODUCTION OF INNOVATIVE APPROACHES: THE HEALTH INNOVATION AND EVALUATION HUB AT CENTRE HOSPITALIER DE L'UNIVERSITÉ DE MONTRÉAL

In November 2016, Centre hospitalier de l'Université de Montréal (CHUM) launched the Health Innovation and Evaluation Hub (CIES – Carrefour de l'Innovation et de l'Évaluation en Santé).

The goal was to increase synergies between researchers, clinicians, industries, and decision makers in order to continuously improve health care and services.

CHUM's objectives

This step is part of CHUM's determination to be a learning, teaching, and communicating hospital.

- Research will make a tangible contribution to addressing issues involving health care and the organization of health services.
- By facilitating discussion at the institution and with its many partners, CHUM wishes to accelerate the establishment of innovative solutions for the well-being of its patients and the public.

The CIES initiative

CIES looks to scientific studies for the thoroughness, critical approach, and creativity needed to develop innovative responses to health issues observed in practice.

- These responses may originate from a care, medical, research, or management team or any other group seeking to benefit from the unique strength of CIES.
- The community of scientists, clinicians, and managers working within CIES strives to gain a better understanding of a situation, convert conclusive data into innovations applicable in care settings, and assess the impact.
- CIES strives for more effective and efficient care by applying the scientific process to innovation in health care.
- It provides a clinical perspective for research, teaching, and management components.
- It helps tear down silos and enables all those who interact with patients to work together in the search for lasting, proven solutions adapted to the public's needs.



Source: CR CHUM

Introduction of the Québec–Janssen Innovation Partnership initiative, with the collaboration of Janssen Inc.

The government is providing setup assistance for the new Québec–Janssen Innovation Partnership. It will invest \$500,000 in this project over the next three years.

The goal is to obtain conclusive data and analyze data from multiple players on the progression of diseases, delivery of health care, and impact of medical interventions.

It will target research projects selected by the Québec government and its partners. Therapeutic areas will be defined in collaboration with MSSS so that the project meets a need of the health and social services network.

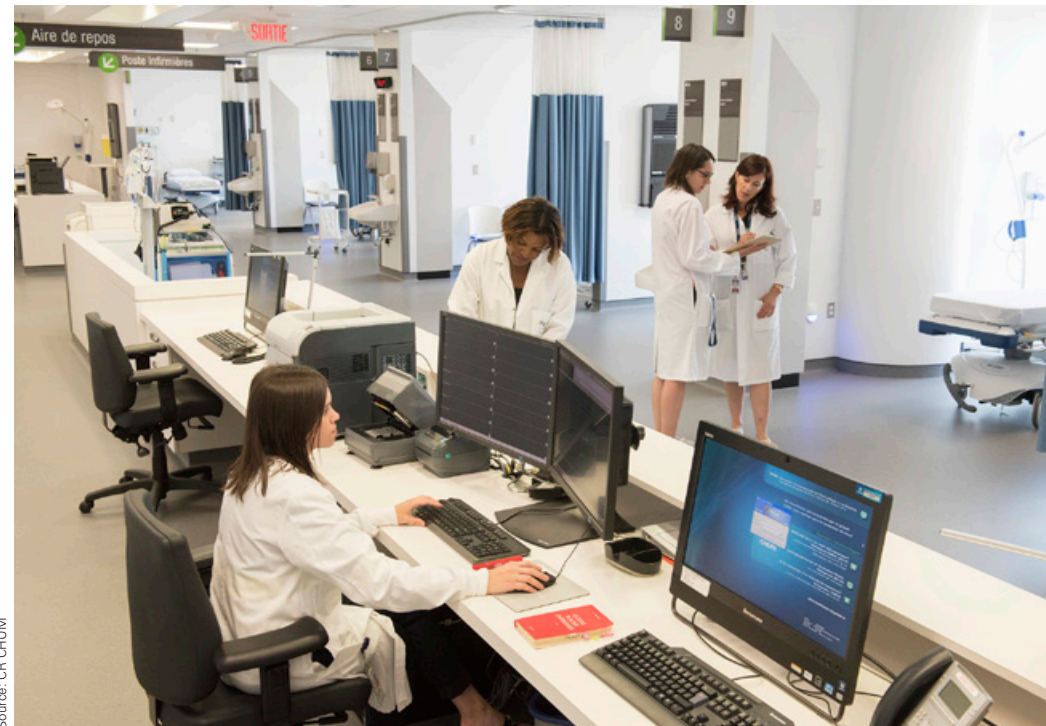
Fonds de recherche du Québec – Santé will administer this initiative.

Approach

This collaborative project to collect real-world evidence data will:

- Establish Québec expertise in real-world evidence data management and analysis
- Provide real-world evidence data for the government and its partners on a selected healthcare problem
- Help develop new healthcare data-related applications
- Improve the efficiency and effectiveness of the Québec network in the area covered by the project

THE GOAL IS TO OBTAIN CONCLUSIVE DATA AND ANALYZE DATA FROM MULTIPLE PLAYERS ON THE PROGRESSION OF DISEASES, DELIVERY OF HEALTH CARE, AND IMPACT OF MEDICAL INTERVENTIONS.



Source: CR CHUM

4.4 FASTER ACCESS TO PROMISING DRUGS

Integration of innovations into the health and social services network must be supported by faster access to new drugs. Under the Québec Life Sciences Strategy, the government is taking action in this regard.

A change to the review process for promising new drugs

The government intends to optimize the Québec drug review model by prioritizing drugs that suggest real added value for patients and the healthcare system as a whole.

It is therefore announcing a change to the drug review process. The goal is to better coordinate review notices under INESSS with notices from CADTH.

Goal: Better coordination with CADTH

It is important that notices filed by INESSS are made available in a timely manner so that MSSS can engage in a listing agreement negotiation process at the same time as the other member provinces of the pan-Canadian Pharmaceutical Alliance (pCPA). Participating in pCPA is the best way to negotiate agreements, provided that INESSS has recognized there is therapeutic value.

Prioritizing tangible innovations

As is already the case, INESSS can start reviewing a drug or a new indication of a drug already on the market before Health Canada has made a decision, to prioritize promising innovations.

Thanks to better time-dependent coordination of the INESSS and CADTH review processes, companies will now be informed of INESSS's recommendations more quickly.

Furthermore, MSSS will be able to engage in the pCPA listing agreement negotiation process earlier. In such cases, agreements must be reached before products are listed.

Québec is also committed to minimizing the time between the delivery of the pCPA's letter of intent and the listing of a drug. It undertakes to ensure that this time period is competitive relative to other provinces.

Determine concrete measures to create a "Québec advantage" to attract more investment

A working group that includes the innovative drug industry will be established to identify ways to create a "Québec advantage" as quickly as possible to attract more investment, while addressing drug approval processes and access to drugs by:

- Reducing the time between the delivery of a notice of compliance by Health Canada and reimbursement by the Québec government
- Adopting innovative approaches

Expected outcome

The appropriate resources will be provided so that the changes are introduced no later than December 31, 2017. INESSS will publish a declaration of services to the public to state its commitment to service quality and delivery. This declaration will be made public by March 31, 2018.

A formal dialogue will also be initiated to continue discussion on other means of speeding up the drug approval process to attract more investment.

The proposed changes will better position Québec with respect to investment in research and drug development. Many pharmaceutical companies look at the rules and timeframes for entering the local market when making investment decisions.

4.5 FINANCIAL FRAMEWORK

For 2017–2022, \$28 million in new money is earmarked for the fourth objective of the Québec Life Sciences Strategy.

TABLE 4

Further Integrate Innovation Into the Health and Social Services Network

(in millions of dollars)

| | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | Existing budget | New money | TOTAL |
|---|------------|------------|------------|------------|------------|------------|-----------------|-------------|-------------|
| Further integrate innovation into the health and social services network | | | | | | | | | |
| 4.1 Creation of Health and Social Services Innovation Office | – | 1.3 | 1.8 | 1.8 | 1.8 | 1.8 | – | 8.5 | 8.5 |
| 4.2 Access to government contracts | – | – | – | – | – | – | – | – | – |
| 4.3 Support for real-world evidence projects | – | 2.5 | 4.0 | 4.0 | 4.0 | 4.0 | – | 18.5 | 18.5 |
| 4.4 Faster access to promising drugs | 0.5 | 0.5 | – | – | – | – | – | 1.0 | 1.0 |
| Total existing budget | – | – | – | – | – | – | – | – | – |
| Total new money – Québec Economic Plan – March 2016 | 0.5 | – | – | – | – | – | – | 0.5 | – |
| Total new budget – Québec Economic Plan – March 2017 | – | 4.3 | 5.8 | 5.8 | 5.8 | 5.8 | – | 27.5 | – |
| TOTAL | 0.5 | 4.3 | 5.8 | 5.8 | 5.8 | 5.8 | – | 28.0 | 28.0 |

Note: Figures are rounded to the first decimal. The total is the reference.

INNOVATION
COMES TO LIFE

IMPLEMENTATION



IMPLEMENTATION OF THE QUÉBEC LIFE SCIENCES STRATEGY

IMPLEMENTATION OF THE QUÉBEC LIFE SCIENCES STRATEGY

FINANCIAL FRAMEWORK OF THE QUÉBEC LIFE SCIENCES STRATEGY FOR 2017–2022

TABLE 5

Financial Framework of the Québec Life Sciences Strategy

(in millions of dollars)

| | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 | 2021-2022 | Existing budget | New money | TOTAL |
|--|------------|-------------|-------------|-------------|-------------|-------------|-----------------|--------------|--------------|
| 1 Increase investment in research and innovation in all life sciences | 4.1 | 13.0 | 20.2 | 20.2 | 19.1 | 18.5 | 9.0 | 86.1 | 95.1 |
| 2 Foster the creation of innovative companies and ensure their growth | – | 14.4 | 15.0 | 9.9 | 4.9 | 4.8 | 11.8 | 37.2 | 49.0 |
| 3 Attract new private investment | – | 4.1 | 6.1 | 6.9 | 7.9 | 7.9 | 32.9 | – | 32.9 |
| 4 Further integrate innovation into the health and social services network | 0.5 | 4.3 | 5.8 | 5.8 | 5.8 | 5.8 | – | 28.0 | 28.0 |
| Total existing budget | – | 8.1 | 10.4 | 11.1 | 12.1 | 12.0 | 53.7 | – | |
| Total new money – Québec Economic Plan – March 2016 | 2.6 | 12.2 | 11.7 | 6.7 | 0.6 | – | – | 33.8 | |
| Total new budget – Québec Economic Plan – March 2017 | 2.0 | 15.5 | 25.0 | 25.0 | 25.0 | 25.0 | – | 117.5 | |
| TOTAL | 4.6 | 35.9 | 47.1 | 42.8 | 37.7 | 37.0 | 53.7 | 151.3 | 205.0 |

Note: Figures are rounded to the first decimal. The total is the reference.

SELECTED TARGETS

General targets of the Québec Life Sciences Strategy

The Québec Life Sciences Strategy is aimed at the following targets:

Ensure that:

- The sector attracts \$4 billion in private investment by 2022
- Québec is among North America's top five life science hubs by 2027

Increase investment in research and innovation in all life sciences

Implementation of the first objective of the Québec Life Sciences Strategy seeks to achieve the following targets:

- Be the province that attracts the most investment in clinical research by 2022
- Be the province that attracts the most private investment in research by 2027

Foster the creation of innovative companies and ensure their growth

The second objective of the Québec Life Sciences Strategy is aimed at the following targets:

- Support the startup and growth of 40 companies through measures carried out by 2022
- Support the growth of up to five flagships by 2027

Attract new private investment

The third objective of the Québec Life Sciences Strategy is aimed at the following targets:

- Attract and support private industrial projects worth over \$500 million by 2022
- Attract at least one major local biomanufacturing project by 2022
- Conduct five key-player hosting events per year that lead to at least 10 collaboration or investment projects by 2022

Further integrate innovation into the health and social services network

The fourth objective of the Québec Life Sciences Strategy is aimed at the following targets:

- Present an average of five technology showcases per year over the next five years
- Conduct an average of 12 real-world evidence projects per year between 2018 and 2022
- Synchronize the listing recommendations of INESSS and CADTH so that the average interval between them is a maximum of one month
- Each year, have started the review of at least five drugs by INESSS prior to the delivery of a notice of compliance by Health Canada
- Reduce the time between the delivery of a notice of compliance by Health Canada and reimbursement by the Québec government

Monitoring the Strategy

Strategy implementation monitoring committee

MESI will set up a committee to monitor implementation of the measures announced, assess their impact, and tally private investments made.

After five years, the committee will propose adjustments based on developments in the sector.

The committee will meet each year with the Minister of the Economy, Science and Innovation and the Minister of Health and Social Services. It will be composed of senior officials from the sector and MFQ as well as the Minister of the Economy, Science and Innovation and the Minister of Health and Social Services.

Dialogue between the government and the main Québec life sciences industry associations

Annual meetings prior to the monitoring committee meeting will be held between government representatives (MESI, MFQ, and MSSS) and the main associations representing innovative and generic drug industries, and biotechnology and medical technology industries.

These meetings will be an opportunity for the associations to inform the government of problems likely to affect the development and economic balance of the sector.

Each association can advocate for the issues it faces. They will also have the opportunity to propose solutions that the private sector can implement, with or without the participation of the Québec government.

**AFTER FIVE YEARS, THE
COMMITTEE WILL PROPOSE
ADJUSTMENTS BASED ON
DEVELOPMENTS IN THE SECTOR.**

Source: Shutterstock



INNOVATION
COMES TO LIFE

CONCLUSION



CONCLUSION

CONCLUSION

The life sciences industry has been part of Québec's industrial fabric for over a century. It is also among the industries that Québec can count on to build its future, ensure its prosperity, and improve the well-being of the public.

Thanks to world class researchers, numerous innovative local and international companies, and a rich and collaborative ecosystem, Québec has made a name for itself on the world stage and can expect to continue its rise.

**CHANGES TO BUSINESS MODELS,
FUNDING ISSUES ALONG THE VALUE
CHAIN, AND COMPETITION TO ATTRACT
FOREIGN INVESTMENT CALL FOR AN
AMBITIOUS, TARGETED STRATEGY THAT
DRAWS ON ALL PLAYERS OF THE SECTOR
TO STRENGTHEN THE COMPETITIVENESS
AND ATTRACTIVENESS OF QUÉBEC.**

Meeting challenges

To be successful, Québec must overcome challenges.

Changes to business models, funding issues along the value chain, and competition to attract foreign investment call for an ambitious, targeted strategy that draws on all players of the sector to strengthen the competitiveness and attractiveness of Québec.

With the Québec Life Sciences Strategy, the government is meeting these challenges by proposing concrete measures that boost the entire value chain, from the research stage to integration of technology and innovations into the health and social services network.

Four main objectives

The Québec Life Sciences Strategy has four main objectives:

- Increase investment in research and innovation in all life sciences
- Foster the creation of innovative companies and ensure their growth
- Attract new private investment
- Further integrate innovation into the health and social services network

A \$205 million financial framework

To meet these four objectives, the government is introducing a number of measures backed by a \$205 million financial framework for 2017–2022.

The government is confident that the new strategy will help strengthen Québec's position internationally by stimulating investment, developing a strong local industry, and deriving further benefit from the integration of innovation into the health and social services network.

It hopes to attract \$4 billion in private investment by the end of the five-year period and position Québec as one of North America's top five life science hubs by 2027.

Under the Québec Life Sciences strategy, innovation comes to life!



Source: CAE

INNOVATION
COMES TO LIFE

APPENDIX

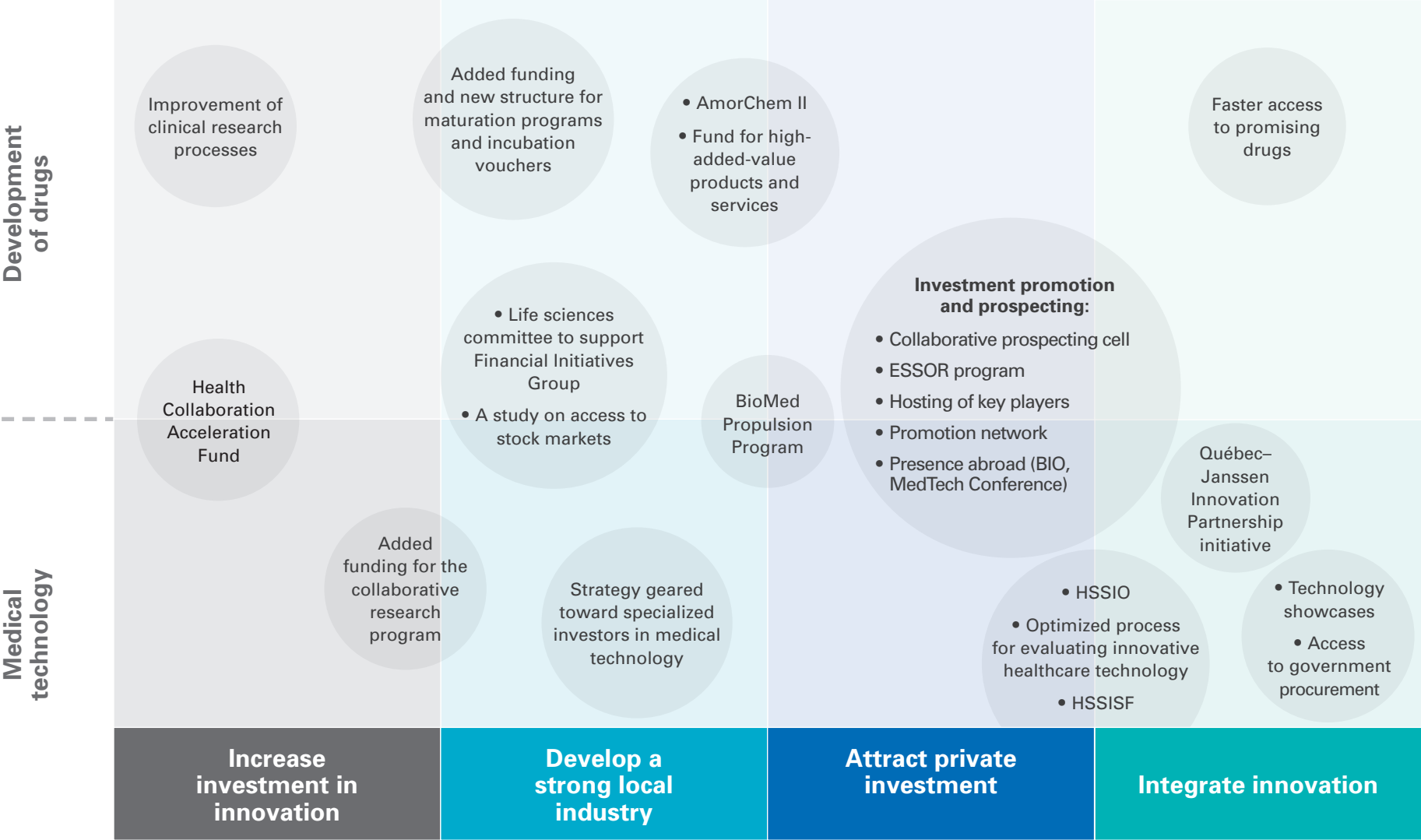


APPENDIX

APPENDIX 1 – SUMMARY OF 2017–2022 QUÉBEC LIFE SCIENCES STRATEGY MEASURES

Québec Life Sciences Strategy

An economic lever to attract \$4 billion over five years



2017–2027
QUÉBEC LIFE
SCIENCES
STRATEGY

economie.gouv.qc.ca/QcLifeStrat