Deloitte.

Study on Public Policy Requirements and Financing Needs

for the Life Sciences and Biotechnology Applied to Human and Animal Health Industry

EXECUTIVE SUMMARY

October 7 2019

CONTEXT, GOALS, AND WORK PLAN

STUDY CONTEXT

With more than 110 members (biotechs, CROs, and other life sciences organizations), BIOQuébec is a not-for-profit organization whose mission is to foster the growth of Quebec's biotechnology and life sciences industry which creates wealth and specialized jobs, is focused on innovation and marketing, and is dedicated to improving everyone's health and quality of life.

In 2017, the Quebec government released the Québec Research and Innovation Strategy (QRIS) and established the ambitious goal of positioning Quebec among the OECD's research and innovation leaders by 2020 and making modern Quebec one of the most successful societies in the world.

That same year, the Quebec government also released a strategy exclusively for life sciences: the Québec Life Sciences Strategy (QLSS), which essentially had two main goals:

- **ATTRACT $4 BILLION IN PRIVATE INVESTMENTS TO QUEBEC BY 2022**
- **MAKE QUEBEC ONE OF THE FIVE MAIN LIFE SCIENCES INDUSTRY HUBS IN NORTH AMERICA**

Now that these goals have been established, BIOQuébec seeks to determine what the life sciences and biotechnology applied to human and animal health industry needs in terms of financing and of public policies and regulations to achieve these ambitious goals. It is for this purpose that BIOQuébec commissioned Deloitte to conduct this study.

OBJECTIVES

01

OPPORTUNITIES AND THREATS
Identify the opportunities and minimize the threats to the industry;

02

FINANCING NEEDS
Assess the life sciences and biotechnology industry's needs within the Canadian context by analyzing current programs and policies and the need to enhance them, if necessary;

03

BENCHMARKING CERTAIN INDUSTRIES
Compare what is being done in Quebec, in terms of the industry's public policies and financing, with other similar locations and business segments to issue recommendations based on best practices;

04

IMPACT AND BENEFITS FOR COMPANIES
Assess the public policy requirements and financing needs of companies as well as their impact on employment and investments;

05

RECOMMENDATIONS AND ADDED VALUE
Establish and prioritize recommendations based on the added value created for Quebec;

06

RECOMMENDATIONS AND ADDED VALUE
Establish and prioritize recommendations based on the added value created for Quebec;

07

IMPACT AND BENEFITS FOR THE INDUSTRY
Present the impact of the suggested measures and their potential benefits based on previous studies conducted in the industry.

METHODOLOGY AND WORK ACCOMPLISHED

	Step 1 Project Launch	**Step 2** Understand Quebec's Public and Financing Policies	**Step 3** Benchmark with other locations	**Step 4** Evaluate Companies' Needs	**Step 5** Write the report and present the results
Main objectives	Review the mandate's terms of reference, share existing information and expectations, define roles and responsibilities, and approve the workplan	Identify Quebec's public and financing policies in the life sciences industry as well as in other segments such as the digital industry, clean technologies, aerospace, and artificial intelligence.	Identify current policies and their effect on attracting direct foreign investments in other locations (4-5) and compare them with Quebec policies.	Conduct a survey of companies in the industry to better understand their financing needs and the potential impact of any new measures.	Present the results of the study and our recommendations to the Steering Committee
Activities completed	✓ Kickoff meeting with BIOQuébec's Steering Committee ✓ Collect available relevant documentation and any from previous projects ✓ Identify organizations and key resources to approach during this process ✓ Discuss and approve the method to be used for this approach ✓ Identify the locations and business segments to use for benchmarking ✓ Launch meeting with the Montréal InVivo financing committee	✓ Review literature and collect secondary information (see Appendix B) ✓ Review relevant documents on the industry (such as QRIS, QLSS) ✓ Consult specialized publications and databases ✓ Consult with Deloitte's specialists ✓ Meet with key stakeholders at MTL InVivo ✓ Benchmark other business segments ✓ Collect primary information by consulting life sciences financing experts ✓ Develop and validate an interview guide ✓ Identify experts able to provide insight into the industry's public policies and financing ✓ Request, plan, and conduct 14 interviews (see Appendix A) ✓ Consolidate results ✓ Preliminary findings	✓ Preliminary collecting of secondary information from documentation available publicly • Specialized websites • Publications and websites from specialized and reputable organizations ✓ Analyze public economic impact studies conducted in other locations ✓ Consult specialized publications and databases to which Deloitte has access ✓ Direct consultation with administrators from the locations under study ✓ Develop an interview guide ✓ Conduct interviews ✓ Consolidate results ✓ Preliminary findings	✓ Create a sampling of 15 to 20 companies (small, large, foreign) operating in the industry at various stages (pre-seed, seed, launch, growth) ✓ Prepare an interview guide to gain an understanding of: ✓ These companies' profile ✓ Their business challenges ✓ Initial, current, and potential investment projects ✓ Their financing needs ✓ The potential impact of these investments ✓ Their assessment of current public policies and programs ✓ Conduct 17 interviews (see Appendix A) ✓ Consolidate results	✓ Draft the preliminary report ✓ Present the preliminary report to BIOQuébec's Steering Committee and discuss the results, namely: ✓ Assess the life sciences and biotechnology industry's additional public financing needs ✓ Identify and prioritize potential programs and measures ✓ Assess the additional investments required from the Quebec government ✓ Potential high level economic impact of these investments ✓ Validate and modify the preliminary report, if necessary ✓ Create an executive summary of the results ✓ Present the results to the Steering Committee and the Board of Directors

PROFILE AND ECONOMIC IMPACT

This page contains data from various sources and years – please refer to the footnotes

*A very important industry in Quebec **with high added value**.*

LIFE SCIENCES AND HEALTH TECHNOLOGY (LSHT) (1,2)

669 companies (+6.2% since 2016)
- 220 in **biopharmaceutical**
- 342 in **medical technology**
- 107 in **natural health products**

32 280 jobs (+4.8% since 2016)
- 17 750 in **biopharmaceutical**
- 12 220 in **medical technology**
- 2 310 in **natural health products**

Average salary of **$70 000**
- More than **60% higher** than the average salary

12% of revenue **invested in R&D**
- More than 3 times higher than in the aeronautic industry

BIOTECHS (3)

135 biotechs
- **49%** of which are less than **4 years old**
- **74%** have fewer than **10 employees**
- **89%** have **fewer than 25**

4 900 direct and indirect **jobs**

Average salary of **$73 800**
- For a total of **$249.2 million** in salaries

$181.4 million invested in **venture capital**

$602.9 million in total **annual expenditures**
- **58%** spent in **Quebec**
- **53 %** spent on **R&D**

$468 million contributed to the **GDP** annually
- **77%** of which is paid in **direct wages**

$155 million in annual **tax revenues** (federal and provincial)

CONTRACT RESEARCH ORGANIZATIONS (CROs) (4)

71 CROs
- **93%** of which have their head office in **Quebec**
- **65%** have **fewer than** 25 employees

4 300 direct **jobs**
- **8%** of the total biopharmaceutical labour force

$224 million in annual **payroll**

$550 million in annual **revenues**
- **82%** of which come from **outside of Canada**

$7 saved on **health costs** for **each $ invested** in a new drug

Sources: **(1)** The Ministère de l'Économie et Innovation du Québec's website, 2018 life sciences companies census (in French only) https://www.economie.gouv.qc.ca/bibliotheques/secteurs/sciences-de-la-vie/recensement-des-entreprises-2018/); **(2)** 2014 data from Montréal InVivo, *"Compétitivité des sciences de la vie et des technologies de la santé du Québec – Rapport synthèse, Étude diagnostique et comparative des sciences de la vie"*, 2016 (in French only); **(3)** 2016 data from BIOQuébec, "Contrat Research Organizations in Quebec – A Powerhouse of Socio-Economic Development for the Province", 2016; **(4)** 2016 data from BIOQuébec and Pharmabio Développement, "Biotechs in Quebec - Several Profiles, A Single Objective: Improving Quality of Life, One Innovation at a Time", 2016

QUÉBEC LIFE SCIENCES STRATEGY'S GOALS

In 2017, the Quebec government released the Québec Life Sciences Strategy for 2017-2027. The QLSS uses four objectives to target several types of companies and several regions in Quebec. The initial budgets and timelines extend to 2022; the second part of the strategy has yet to be released.

THE QLSS' GENERAL TARGETS

- To attract, by 2022, four billion dollars in private investments
- To be, by 2027, one of the five main industry hubs in North America

THE QLSS' MAIN GOALS

THE GOALS' SPECIFIC TARGETS

Increase investments in research and innovation in all branches of life sciences

- Risk sharing
- Promote the health and social services network's assets

- To be, by 2022, the province that attracts the most investments in clinical research
- To be, by 2027, the province that attracts the most private investments in research

Foster the launch of innovative companies and ensure their growth

- From the seed and start-up levels
- Support the expansion of successful companies
- Develop new Quebec-based industry leaders

- Support the launch and growth of 40 companies through operations being conducted through 2022
- Support the growth of up to five high-potential paragons by 2027

Attract new private investments

- Prospect for private investments
- Promote the industry

- Attract and support private industrial projects valued at more than 500 million dollars by 2022
- Attract at least one major biomanufacturing project by 2022
- Connect with key stakeholders five times per year, leading to at least ten collaborative or investment projects by 2022

Further integrate innovation into the health and social services network

- Establish the *Bureau de l'innovation* (office for innovation) in health and social services
- Access to government contracts
- Support assessments in real-life care situations
- Quicker access to drugs

- Produce at least five technology showcases per year for the next five years
- Perform an average of twelve real-life care situation evaluations per year between 2018-2022
- Synchronize the *Institut national d'excellence en santé et en services sociaux*'s listing recommendations with those of the Canadian Agency for Drugs and Technologies in Health so that there is no more than one month difference on average between the two
- Initiate an evaluation by *l'Institut national d'excellence en santé et en services sociaux* of at least five drugs before the Health Canada notice of compliance is issued
- Reduce the time between Health Canada's issuance of the notice of compliance and the Quebec government's reimbursement

Source: Gouvernment of Quebec, "Québec Life Sciences Strategy", 2017

CANADIAN STRATEGIC DIRECTIONS FOR LIFE SCIENCES

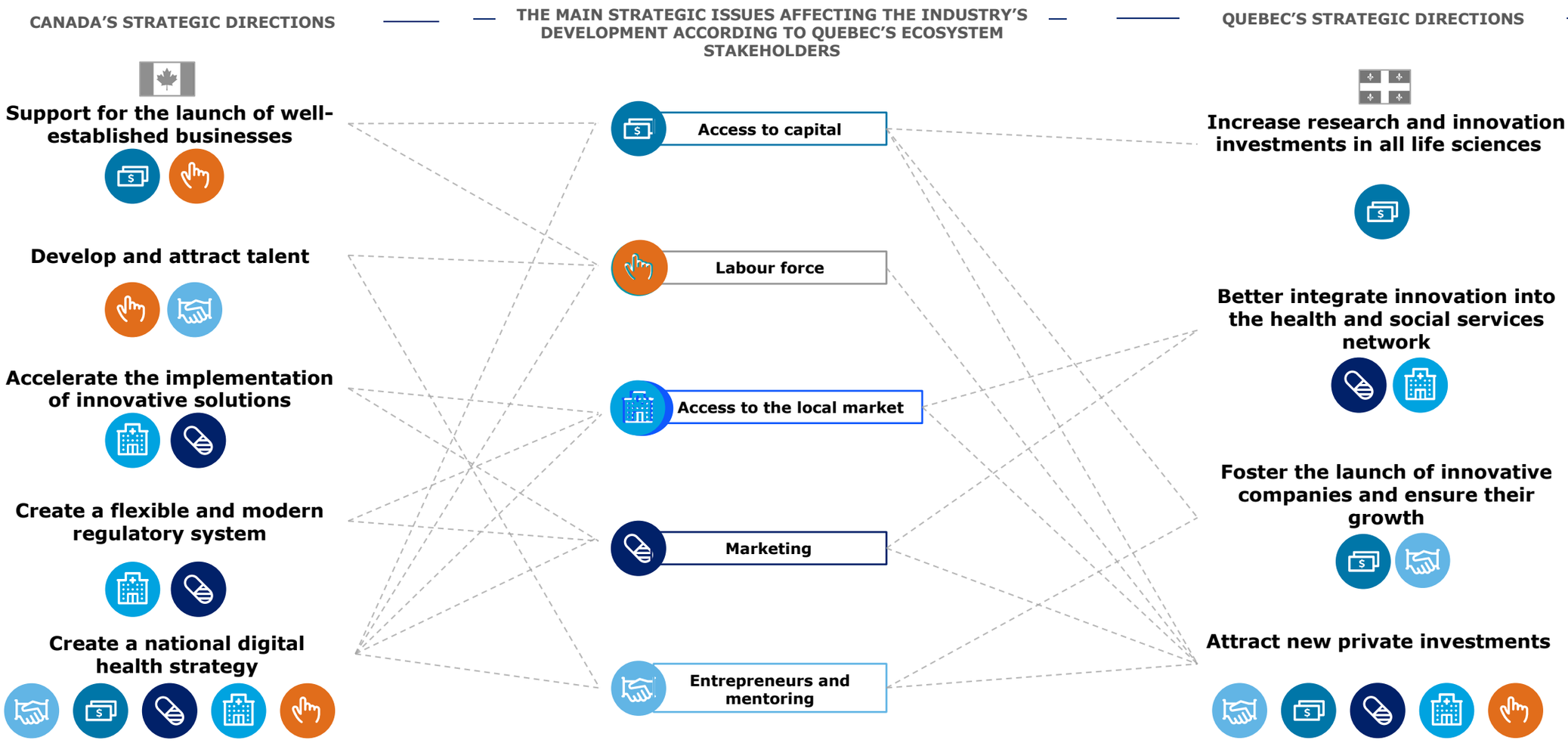
Following the latest of Canada's Economic Strategy Tables, five strategic directions were established. The measures associated with these strategies were to have started to be implemented this year (2019).

ACCELERATE THE INTEGRATION OF INNOVATIVE SOLUTIONS	CREATE A FLEXIBLE AND MODERNIZED REGULATORY SYSTEM	CREATE A NATIONAL DIGITAL HEALTH STRATEGY	TALENT DEVELOPMENT AND ATTRACTION	SUPPORT FOR CREATING LONG-LASTING BUSINESSES
Through value-based procurement and the establishment of an organization that will oversee procurement innovation	By adopting best practices from other countries, eliminate repetitive governance practices and reduce review times	Provide an interoperable digital health platform (compatible with all systems)	World-class level, by providing Canadians with the necessary tools, removing barriers to employment, and streamlining government skills programs	By raising capital at more advanced stages, expanding the reach of high-potential companies, and improving tax incentives for research and development
• **Value-based procurement in Canadian health systems:** Implement value-based procurement approaches in F/P/T (federal, provincial, territorial) health systems for conditions that represent a high mortality rate among Canadians • **Value-based procurement for health sectors under federal authority:** Develop and test value-based purchasing models in federal ministries that have a direct role in health services • **Procurement innovation agency with a shared mandate in both health and economy:** Coordinate efforts to identify innovations that add value to the health care system and create the factual database which will be used to support their acquisition and implementation	• **Intensify the federal government's efforts to increase regulatory flexibility:** Regulatory modernization should lead to increased international collaboration and fewer procedural duplications and delays • **Agency for competitive and innovative health regulations:** Decrease red tape and implement administrative standards between the FPT systems and make it easier for innovative products to gain access to the local market	• **A digital health strategy which:** Establishes a national framework to oversee standardized governance, data sharing, and confidentiality in FPT systems • **Manage a fully compatible digital health platform** Between two or more agencies and ideally, between all agencies in Canada • **Universal access to high-speed Internet** To avoid a digital divide in Canada • **Collect and standardize data:** Create repositories to store, retrieve, and process data and capitalize on advances in the analysis of large amounts of data from artificial intelligence and the Internet of Things.	• **A Canadian hub for life sciences talent** Promote the industry's jobs, accept career transitions, identify and structure the development of the jobs of tomorrow, increase opportunities for learning on the job • **Create a digital inventory of talent available in Canada** In life sciences • **Foreign talent** Limit barriers to hiring highly-skilled foreign talent and improve the foreign credentials recognition system • **Experienced managers paired with smaller companies** Initiative to make experienced managers more affordable for small and medium businesses • **Modernize and standardize programs** Update skill development and training programs financed by the federal government	• **Funds for mature companies** Support and invest in establishing and developing late-stage capital • **Foster the development of flagship companies** Identify companies with high potential and give them the opportunity to become success stories • **Modernize SR&ED credits** Allow eligible companies to have access to credits, whether they are controlled by Canadian investors or whether they are publicly or privately traded • **Dual-listed stock structure** Limit barriers and encourage dual listing of Canadian life sciences companies on the TSX and NASDAQ • **Funds for licensed inventions** For any Canadian company willing to grant a license for the future development of a discovery

Source: Innovation, Sciences and Economic Development, "Economic Strategy Tables", 2018

THE QUEBEC INDUSTRY'S STRATEGIC ISSUES **WITHIN THE CANADIAN CONTEXT**

The issues highlighted in this study are well defined in the life sciences strategies and goals of both levels of government.



Sources: "Québec Life Sciences Strategy", 2017; Innovation, Sciences and Economic Development Canada, "Economic Strategy Tables", 2018; interviews with industry experts, 2019

FINDINGS ON THE GOVERNMENTAL STRATEGIES

An analysis of the Canadian industry's goals and priorities leads to four key findings on the governments' and the industry's strategic alignment.

1

Alignment of objectives
There is an alignment between the strategic objectives and directions of both levels of government and the issues highlighted in this study

2

Quebec's additional objective
The Quebec government considers foreign direct investment to be very important
- Although considered important and necessary, foreign direct investment is not seen as a priority by a majority of the organizations consulted for this study. However, these investments contribute to the ecosystem's development and provide additional economic benefits for Quebec

3

Canada's additional objective
The Canadian government considers the industry's digital transition to be an important issue
- While beneficial and relevant, the industry's digital transition does not appear to be a high priority for the stakeholders consulted for this study

4

Balance between ambition and action
A high degree of alignment does not necessarily mean that existing measures and budgets can adequately meet the specific needs of Quebec's life sciences industry, which is why the next phase of this study seeks to have current and future measures correspond to the industry's needs.

MAJOR STRATEGIC ISSUES FOR **THE INDUSTRY'S DEVELOPMENT**

This study found that **5 major issues** are hindering the industry's development:

Current situation
Limited development of the life sciences industry in Quebec

ENTREPRENEURS AND MENTORING

Need for mentoring within companies, i.e. putting the right entrepreneurs in the right places
Need for additional tools to launch businesses to generate a larger critical mass

ACCESS TO CAPITAL

In general, all development stages combined
Shortage of lead investors
Issues at seed stage, a vehicle for phase lll is needed, causes companies to leave
Too many public financing initiatives are geared to universities

MARKETING

Several large pharmas have left Quebec, which makes it more difficult for smaller biotechs to connect within the province

Companies typically relocate before the pre-marketing, phase lll

As such, there are few anchor companies – an essential component of any ecosystem

ACCESS TO THE LOCAL MARKET

Quebec's health system (procurement) is not very open to innovation, which makes it difficult to complete initial sales in Quebec

Local integration should serve as a showcase for foreign markets

Procurement should be based on an innovation's actual value, taking into account the long-term result and not only the immediate cost

LABOUR FORCE

Shortage of qualified, experienced entrepreneurs who have previously launched their own companies, shortage of specialized workers (but high-quality researchers are available)

Issues with international recruitment

Discrepancy between what researchers working in academic settings experience and what they experience once they are in the industry

FUTURE OUTLOOK:
Development of Quebec's life sciences industry is stimulated

Source: Deloitte; interviews with ecosystem stakeholders, 2019

CURRENT STATE

QUEBEC'S LIFE SCIENCES INDUSTRY

THE INDUSTRY'S DISTINCTIVENESS

Six significant factors differentiate Quebec's life sciences from its other business segments:

DEVELOPMENT TIME FRAME
- A longer development cycle than the average innovation in other industries, which may disqualify LS from generic programs requiring, for example, proof of income over the last 3 years, positive cash flow, etc.
- The limited duration of patents, combined with long processing times to obtain approvals, reduces the time available in which to achieve a return on investment

UNCERTAINTY ABOUT AN INNOVATION'S SUCCESS
A LS innovation can only really be marketed after years of clinical development. As such, it is more difficult to quickly determine whether a life sciences innovation will be successful because there is no guarantee the innovation will make it to market. In other business segments, while an innovation must still establish itself in the market, it takes less time for those segments to determine if it will at least make its way to market.

THE INDUSTRY'S VERY RIGID STANDARDS
The life sciences industry is a very standardized one. The main reason is its direct impact on people's lives. Like the aerospace industry, but unlike clean or digital technologies, this industry's stringent standards ensure the safety of end-users. In short, obtaining technical, regulatory, and commercial approvals is very intricate.

INNOVATIONS' TECHNICAL NATURE AND COMPLEXITIES
Understanding the depth of the impact a life sciences innovation can have is not easy; only those with advanced life sciences knowledge are able to do so. General analysts may have difficulty understanding the scope of an innovation's impact or the technical, regulatory, and commercial issues associated with it.

MAJOR FINANCIAL INVESTMENTS
- The scope of the financing needed when fully developing a new project, from discovery to marketing, is significant. The amounts available through some generic programs are based on conditions in other business segments and as such, they do not meet life sciences' financial needs. Many small companies must join forces to raise the necessary funds. Attracting one single investor is not enough.

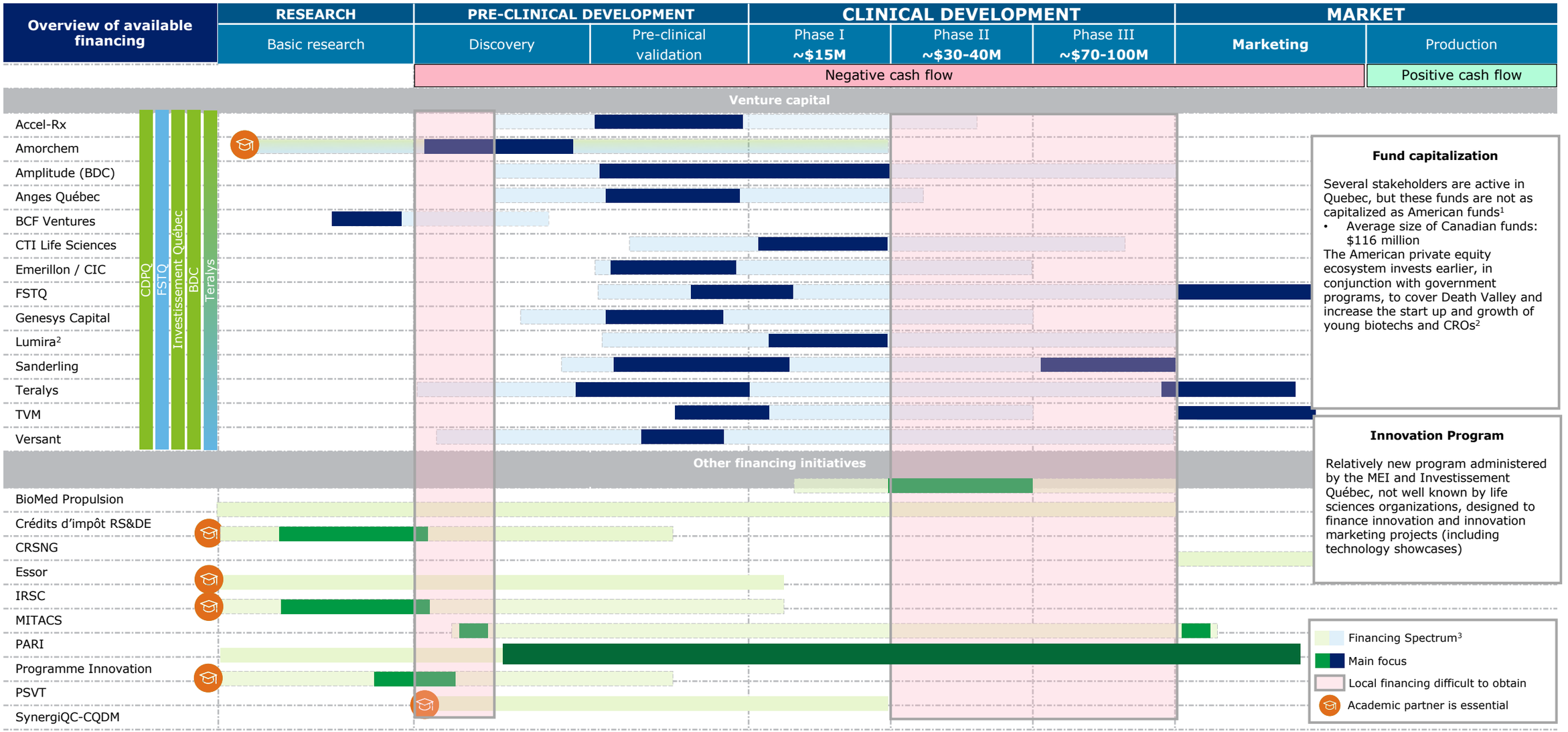
A FRAGMENTED ECOSYSTEM
Its many participants and ramifications make the life sciences industry very difficult to unify. It is fragmented and international, as are its value and financing chains. Networking and collaboration between academic institutions, researchers, marketing firms, research consortiums, research institutes, the health system, private equity funds, public initiatives, entrepreneurs, and industry giants are not easy.

Sources: interviews with industry experts, 2019

MAIN **FINANCING OBJECTIVES** BY TYPE OF ORGANIZATION

BIOTECH	CROs	PHARMA	ANIMAL	MEDTECH
The **biotech** industry seeks to obtain financing for all its development activities since no revenue is expected before the marketing stage. Younger biotechs should have more access to public financing.	**CROs** rely on **tax credits** to be more competitive. They want as many clients as possible. They need capital to finance their growth as well as mergers and acquisitions. Consolidation is to be expected in the coming years to access larger market segments and provide services which are complementary.	**Pharmaceutical:** little in the way of financing, except when expanding operations or production installations to decrease investments by the parent company or Canadian affiliate (debt based on future revenues). They are generally well-structured to benefit from available tax credits and subsidies.	**Animal health**: Require financing mainly during the marketing phase (because pre-clinical and clinical development phases are shorter). More chance of bringing the innovation itself to market (direct or distributor) vs a biotech that could be acquired by a pharma before the marketing stage (with a licensing agreement after positive results at phase ll).	Marketing **medtech** products is done based on evidence-based data which is proven, demonstrated, and supported by opinion leaders. This data must be generated, which makes the marketing process so expensive. If the clinical validation is conclusive and proven, credibility and demonstrability make marketing easier.
Financing new product development, from research to commercialization.	+ Competitiveness + Growth	+ Competitiveness + Growth + Access to market	Help with marketing, growth through acquisitions, and developing new products.	Clinical validation should be seen as a fundamental step in marketing, even if it does not easily produce results.

Sources: Deloitte; interviews with ecosystem stakeholders, 2019



Private management

- The diagram (see above) shows the occurrence of venture capital in the life sciences financing chain and the concentration from pre-clinical validation to phase II of clinical development; applicable from the end of pre-clinical validation to the beginning of phase I
- To fully understand the scale of investments, it is important to consider the total value and number of transactions carried out in recent years; this analysis is presented in the following pages

Public initiatives

- The diagram (see above) displays the occurrence of public initiatives in the life sciences financing chain and shows the concentration in basic research and discovery, although some initiatives apply to almost the entire chain
- To fully understand the impact of current initiatives, it is important to understand the conditions they include and how they correspond to the industry's needs; this analysis is presented in the following pages

Note: 1- According to some venture capital experts in Quebec 2- Includes all Lumira funds 3- Represents the entire range of projects studied and includes some unrelated anecdotal investments
Sources: Deloitte; interviews with ecosystem stakeholders, 2019; BIOQuébec; Amorchem; MTL InVivo

UNDERSTANDING THE VARIOUS **SUBSIDY AND TAX CREDIT PROGRAMS**

The industry considers that it is difficult to understand the various programs, their complexity, and their divergent eligibility criteria. Getting help from a support organization's single access point would be a very useful way for companies to benefit from the available assistance.

STANDARDIZED CRITERIA
Not knowing if they will be able to acquire the money, some organizations opt to view programs only as a potential bonus rather than a fundamental component of their financing.

The SR&ED tax credit criteria cause certain eligibility issues for some businesses.

ABUNDANCE OF PROGRAMS
The number of programs and their respective changes make it difficult to access and understand them.

"Rather than continuously creating new programs, we should properly adapt existing ones instead; we lose track of old programs and don't know what becomes of them."

COMPLEXITY OF APPLICATION PREPARATION
Due to the complexity of the process, organizations often need the help of consultants to prepare their applications.

TRANSPARENCY
Lengthy delays without knowing the reasons
More difficult for smaller businesses

DECISION AND IMPLEMENTATION TIMES
Especially slow for export programs

LIFE SCIENCES' DISTINCTIVENESS
Programs are sometimes mutually exclusive and therefore limiting

Issues involving intellectual property or foreign companies' criteria limit thresholds

Programs are often generalized: life sciences organizations are disqualified as they don't meet eligibility criteria

PUBLICIZING AND PROMOTING PROGRAMS
Export assistance programs in particular

The Innovation Program is not well-known

Very difficult to find the right programs for which a company is sure to qualify

Difficult to know about the various programs, except for those financing basic research, which is less complicated

INTENT VS EXECUTION
- The industry appreciates and recognizes the government's good intentions but their execution is often flawed
- MEI personnel is highly accessible and qualified
- Political mandates are measured over three year periods whereas life sciences' ones extend over an entire decade

TAX CREDIT REQUEST EVALUATIONS
- The Canada Revenue Agency (CRA) issues guidelines which Revenu Québec must follow
- Revenu Québec seems to lack predictability and consistency when approving and interpreting
- Viewed as arbitrary from one year to the next

IMPACT OF THIS LACK OF PREDICTABILITY
- Annual budget estimates are established according to anticipated credits

Sources: Deloitte; interviews with ecosystem stakeholders, 2019

ORGANIZATIONS' **ABILITY TO ACCESS** SR&ED CREDITS

Over the past five years, there has been a considerable decrease in the credits allocated to organizations, who now must also deal with less predictability and several administrative issues.

RECENT CHANGES WITHOUT CLEAR DIRECTION

The SR&DE credit program undergoes frequent, significant **changes without** providing **clear direction** to applicants:

- Considerable decrease in credits allocated (almost 50% over 5 years)
- Considerable decrease in the number of applications
- The CRA abolished sectoral enforcement policies in 2014, which led to more arbitrary eligibility rulings
- Even in cases where eligibility requirements have been met, tax authorities are now more frequently refusing SR&ED expenses

ADMINISTRATIVE PROBLEMS AND ISSUES

Recipients are reporting many **problems with the program's administration**:

- Several requirements are viewed as excessive (such as timesheets) for companies that do nothing other than research
- Applicants complain about the often dogmatic and arbitrary approach taken by the research and technology consultants
- Reviews differ greatly between CRA and Revenu Québec agents
- The CRA/Revenu Québec approach to resolving disputes is viewed as ineffective (administrative delays, useless review requests; only court appeals are considered potentially effective)

BETTER FOCUS, LESS FRAGMENTATION

SR&ED funds should be **more focused**:

- The broad allocation of credits prevents very innovative organizations from having more consistent access to credits
- Credits do not recognize the scientific complexity of the projects submitted
- LS organizations' financial context is not taken into consideration
- The threshold of eligible expenses in Quebec prevents several young start-ups from having access to SR&ED payroll credits

POTENTIAL IMPROVEMENTS TO THE PROGRAMS

The SR&ED programs could benefit from improvements:

- The lack of credit predictability is an ongoing issue
- Several applicants would prefer a more traditional research financing system: a more predictable program, over several years, with requests analyzed based on merit before activities are even initiated
- Auditors should be more familiar with the life sciences environment (ex.: regulatory affairs, multinational research)
- Applicants would like a review system which is more fair, efficient, and independent
- Applicants would like more precision on who is eligible to claim (ex.: contract research)

Sources: Deloitte; interviews with ecosystem stakeholders, 2019

ORGANIZATIONS' VIEWPOINT ON SR&ED CREDITS

COMPLEXITY AND TRANSPARENCY

- Most of the organizations questioned have external help (consultants and external firms) to prepare and submit their credit applications:
  - This shows that an industry has developed as a result of these credits being difficult to understand
  - It seems that in some cases, a single word in an application can make a difference
- The organizations which are satisfied with the process have all used help from external sources

EXCLUDING THE FIRST $50 000

Organizations don't agree on this exclusion:

- Some agree with it as it still allows organizations which already have adequate financing to receive subsidies
- Some disagree as it has a very big impact on smaller organizations just starting out

PROCESS AND ALLOCATION

- Processing times are considered to be a bit long
- Some organizations have noted issues with cash flow management because of delays with credit refunds
- Young businesses should not assume they will obtain these credits
- Credits are smaller now than they have been in the past
- Equipment is no longer eligible, which has led to 'virtual' companies being launched: they use CROs' laboratories and services rather than acquiring their own

IMPACT ON THE INDUSTRY

- A competitive and distinctive advantage in Quebec
- Essential for young organizations at the start-up and growth stages
- Significant benefits for life sciences, despite the issues

CASE IN POINT – CCPC AND R&D CREDITS

- Updating SR&ED credits (which is already included in the Canadian life sciences strategy) to authorize businesses, whether they are controlled by Canadian investors or publicly or privately traded, will help several organizations in Quebec that currently don't make full use of their SR&ED credit eligibility due to their current governance situation. The Canadian government intends to improve the situation; in fact, SR&ED credits are administered by the CRA.

TAX CREDITS AND CROs in QUEBEC

SR&ED tax credits impact CROs in a very specific and significant way. As such, Deloitte addressed this issue with due consideration: the detailed results appear in the

following pages.

Source: interviews with ecosystem stakeholders, 2019

MAIN ISSUES RELATING TO PUBLIC POLICIES IN LIFE SCIENCES
(OTHER THAN FINANCING)

ACCESS TO THE LOCAL MARKET

The health system manages its purchasing budgets in silos

Unwillingness to use the health system as a technology showcase

It is difficult to access the local market

Potential solutions to make it easier to access the local market and to integrate innovations

LABOUR FORCE

Its quality is not called into question

Issues with the number of workers

Partial shortage in certain employment categories
Long term issues

Prepare the next generation for future areas of focus

Potential solutions to the labour force shortage issue

A COMPREHENSIVE QUEBEC INDUSTRY

Two schools of thought on whether it is feasible and sustainable

Examples of success stories

Quebec's comparative advantages

Potential solutions to foster the full development of a project within Quebec

FOREIGN DIRECT INVESTMENT

Industry consensus on the benefits of FDIs
Its prioritization is not undisputed

Potential solutions suggested by the QLSS are aligned with those of the industry

Pistes de solution de la SQSV bien alignées avec l'opinion de l'industrie

INTEGRATING PRODUCTS AND TECHNOLOGIES DEVELOPED IN QUEBEC *(cont.)*

Update on the QLSS' intentions and initiatives, as of May 29 2019

Current Status	Update on targets and objectives
Health system purchasing budget management in silos Innovation sometimes costs more in the short term but can be very advantageous over the long term Perceived unwillingness to spend more to support innovation	Réaliser en moyenne 12 évaluations en situation réelle de soins par année entre 2018 et 2022; ✓**55 projets soutenus depuis 2 ans.**
Unwillingness to use the health system as a technology showcase There is no fast access or buy local selection criteria to transform the health system into a technology showcase – initial sales in Quebec are difficult	Réaliser en moyenne cinq vitrines technologiques par année au cours des cinq prochaines années. ✓**Première année du Bureau de l'innovation**
Very difficult to access the local market (up to 5 years and 4 selection stages per drug) For drugs (PMPRB, PCPA, HTA, INESSS) and other health innovations, it is more difficult for organizations to access the Canadian market than the American or European ones	Synchroniser les recommandations d'inscription de l'INESSS et celles de l'ACMTS pour que l'écart moyen entre les deux soit d'un mois maximum. ✓**Recommandations transmises dans un écart moyen de 34,8 jours (18 jours d'écart en médiane)**
	Avoir commencé chaque année l'évaluation d'au moins cinq médicaments par l'Institut national d'excellence en santé et en services sociaux avant la délivrance de l'avis de conformité par Santé Canada. ✓**En attente de données**
	Réduire le délai entre la délivrance de l'avis de conformité par Santé Canada et le remboursement par le gouvernement du Québec. ✓**Données non disponibles**

The Quebec government is well aware of the situation, and the industry suggests potential solutions for meeting the QLSS' goals

OTHER SOLUTIONS SUGGESTED BY THE INDUSTRY

- Changes required at the ministerial level (Health and MEI) because hospitals don't currently have the ability to finance innovation by providing access to developed products
- Possible early approval between a successful clinical trial in Quebec and the INESSS' approval stage; this would remove the commercial risk, leaving only the risk associated with development – in Japan and the U.S., early approvals are currently used, which eliminates the commercial risk while the product is still in development.

Sources: Deloitte; "Québec Life Sciences Strategy"; interviews with ecosystem stakeholders, 2019

THE INDUSTRY'S LABOUR FORCE IN QUEBEC

An issue of quantity rather than quality – while there isn't a global shortage, the industry's stakeholders do have some concerns.

2016

Situation according to Montréal InVivo

- Quebec could face a critical shortage of students to guarantee a sufficient number to resupply its talent pool in the long term
- Potential rapid growth of LSHT in Quebec could lead to difficulties in recruiting specialized workers
- Many postgraduates but not enough students from lower levels

2019

Situation according to ecosystem stakeholders

- Fewer students in the industry
- Shortage of qualified, experienced entrepreneurs who have previously launched their own companies
- Shortage of specialized workers
- Shortage of specialized managers
- The industry has high-quality researchers
- The industry lacks the funds to hire more key assets

Current and future state of the labour force

	Quantity	Quality
Current	• Market liquidity in 2019 is not at an alarming level • Need for technical and non-specialized workers • Need for experienced and highly qualified labour force, which is simply not always available in Quebec • It is therefore difficult to attract these experts to Quebec • Many qualified Quebec expatriates	• Ecosystem stakeholders do not question the quality of the training received by available workers • The industry has high-quality researchers • However, there is a difference between what researchers working in academic settings experience and what they experience once they transition to the industry • Laboratory technicians' training programs do not meet the current industry requirements
Future	• Fewer life sciences students because the industry is not promoted as being an attractive one • Do not guide all students towards obtaining PhDs, but rather promote B.A. and college programs to balance out the number of workers per academic level	• Important to continue to train budding scientists according to future industry needs (using AI, genomics, etc.) • Adapt laboratory technician training programs

POTENTIAL SOLUTIONS

- Encourage immigration for specialized workers rather than limit it
- Provide assistance for U.S. and European citizens (researchers and managers) to work in life sciences in Quebec
- Promote the industry to young people
- Bring our expat experts back to Canada
- Assess the relevance of current training, especially for laboratory technicians
- Salaries are higher in Europe and the U.S. for the same professions; refocusing attention on these professions would help drive the industry
- A program to subsidize researchers' transition to the industry, as the learning curve is steep and it is very difficult to adapt to working in a company
- Create a general database to find life sciences workers (included in the Canadian strategy)

Sources: Deloitte; interviews with ecosystem stakeholders, 2019; Montréal InVivo, *"Compétitivité des sciences de la vie et technologies de la santé du Québec"* (in French only)

POTENTIAL SOLUTIONS FOR IMPROVING PUBLIC POLICIES *(OTHER THAN FINANCING)*

ACCESS TO THE LOCAL MARKET

- Procurement based on the real value of an innovation to the entire system
- Technology showcase in our health system
- A unified and simplified access system for the Canadian market

LABOUR FORCE

- Promote immigration for specialized workers rather than limit it
- Subsidize researchers' first years in the industry
- Provide assistance for U.S. and European citizens (researchers and managers) to work in life sciences in Quebec
- Promote the industry to young people
- Repatriate our expat experts
- Assess the relevance of current training
- Refocus attention on the industry's professions to help drive it
- Revisit the foreign researchers program

A COMPREHENSIVE QUEBEC INDUSTRY

- Public investments in funds, such as TVM or others, that invest in late-stage
- Public support for creating a fund strictly for late-stage investments - $300 million to $500 million required (estimate)
- Make access to the local market faster and easier
- Finance the last phases of development and the first phases of marketing locally to prevent companies from leaving

FOREIGN INVESTMENT

- Coordinate private investment prospecting endeavours [1]
- Promote Quebec's life sciences industry internationally[2]
- Do not choose foreign companies at the expense of local ones
- Important to be conscious of maintaining balance in the industry

SPECIFIC SOLUTIONS FOR THE ANIMAL HEALTH FIELD

- Promote Quebec product distribution agreements with international distributors
- Make the animal health products and the research installations (and production, when applicable) approval processes more predictable and standardized

Notes: 1,2: "Québec Life Sciences Strategy"

BENCHMARKING

SUMMARY OF THE LIFE SCIENCES' SECTOR'S PROFILES AND ECONOMIC IMPACT
IN THE LOCATIONS STUDIED

Following discussions with the Steering Committee, these four locations were selected because of the size of their life sciences industry and its impact on their respective economies.

Sector Profile	Ontario (2017)	California (2017)	Massachussetts (2016)	North Carolina (2016)
Number of businesses/institutions	**6 140** (inst.)	**3 418** (bus.)	**2 567** (inst.)	**3 843** (inst.)
Number of jobs	**90 000**	**311 000**	**99 000**	**76 000**
Total revenues	**$57B** (2016)	**$178B**		**$2.5B**
Average salary	**$61 328**	**$119 070**	**$135 200**	**$91 307**
Total payroll	**$5.5B**	**$37.1B**	**$13.4B**	**$6.8B**
Total economic impact				
GDP	**$58.1B**			**$83.3B**
Jobs	**191 300**	**958 000**		**240 300**
Total tax revenues	**$8.8B**	**$18.9B**		**$2.2B**
Venture capital investments		**$5.5B** (2018)	**$3.6B** (2017)	**$860M** (2018)

INTERESTING MEASURES STEMMING FROM THE BENCHMARKING

Four specific and inspiring measures were identified; these could be integrated into discussions on concrete initiatives to adopt to provide better financing and support to Quebec's life sciences industry.

- With public investments of nearly $40 billion per year in biomedical research through 50 000 grants, contracts, and loan repayment programs, the **National Institutes of Health (NIH)** is the U.S. life sciences industry's largest source of financing. With nearly $8 billion (or 20% of its annual investments) awarded to research institutes in the three U.S. states considered, the financing provided by the NIH plays a fundamental role in developing their respective life sciences industries.

- The **Small Business Innovation Research (SBIR)** and the **Small Business Technology Transfer (STTR)** programs are two other federal subsidy programs available to small U.S. life sciences companies which also contribute to developing their technologies. Their total budget of nearly $2.5 billion, including $800 million from the Department of Health and Human Services (in 2015), represents a significant source of financing for the various product development phases within American companies in this industry. **These programs' relevance to the specific financing needs of life sciences organizations** is validated by the **One North Carolina Small Business** programs offered by the North Carolina Department of Commerce. These programs provide grants to life sciences companies to match funds received from similar federal programs and contribute to their subsequent financing.

- The **non-dilutive nature of the seed loans** and **subsidies** provided by the **Massachusetts Life Sciences Center (MLSC)** appears to be a key component of the public financing provided to life sciences companies in Massachusetts. As such, they are **incentives for early investors**, who see their investment retain its value for a longer period while increasing the capital made available for investment.

- Among the various tax incentives offered by the MLSC to Massachusetts life sciences companies and investors, the **tax credit given to angel investors** (on 20% of their investment) is an incentive which can appeal to investors and encourage them to take risks in this sector. It should be mentioned that the Canadian province of British Columbia has a similar program.

  - The information collected and an interview conducted with Life Sciences Ontario show that Quebec is doing quite well compared to Ontario when it comes to financing and public policies specific to their respective life sciences industries

RECOMMENDATIONS

SCOPE OF RECOMMENDATIONS

In 2017, the Quebec government released the Québec Research and Innovation Strategy (QRIS) and established the ambitious goal of positioning Quebec among the OECD's research and innovation leaders by 2020 and making modern Quebec one of the most successful societies in the world. In that same year, the Quebec government also released a strategy exclusively for life sciences: the QLSS, which is centred on two main goals:

- **ATTRACT $4 BILLION IN PRIVATE INVESTMENTS IN QUEBEC BY 2022**
- **MAKE QUEBEC ONE OF THE FIVE MAIN LIFE SCIENCES INDUSTRY HUBS IN NORTH AMERICA**

Now that these goals have been established, BIOQuébec would like to use this report to issue recommendations on what the industry needs in terms of financing and of public policies and regulations to achieve these ambitious goals. The following recommendations pertain to the five main thematic issues targeted by industry stakeholders, namely:

Other recommendations apply to foreign investments. The following icon leads to the recommendations for fostering foreign investments in life sciences.

Also, some of the recommendations only apply to animal health due to its distinctiveness.

RECOMMENDATIONS

ACCESS TO CAPITAL

1a. INCREASE THE EFFICIENCY OF INNOVATION TAX CREDITS

The study revealed clear needs for financial support for innovation from the Quebec government, through a program which is widely accessible as well as through one for life sciences in particular, that would help achieve the QLSS' goals.

Access to capital **Foreign investment**

Improve the tax credit program for R&D salaries:

- Modify the most penalizing elements of current policies, such as restrictions on double subcontracting (e.g. MITACS) and requiring timesheets in an industry that rarely uses them (companies doing research and development only)
- Foster the development of specific and standard training for those who assess credit applications from life sciences companies, to harmonize and accelerate application processing
- Eliminate the $50 000 threshold for start-ups (3-year grace period for new businesses)
- Make the review of salary eligibility decisions more transparent and consistent through an independent decision review process

Institute a tax credit for producing intellectual property in life sciences similar to the one for companies specializing in producing multimedia titles: This 30% refundable credit on salaries would be available to companies of all sizes established in Quebec, whether or not they are Canadian-controlled, for the production of intellectual property (patented or not) in life sciences. To improve their financing predictability, a certificate of eligibility for corporations should be issued by Investissement Québec or by the MEI before operations begin. Eligibility criteria for this credit should include a "marketing" component to facilitate the marketing of developed products as outlined by the IRAP program. This new tax credit would allow companies such as EnGene or Repare, for example, which were able to attract foreign investment, to benefit from this credit and not be penalized for having been successful in attracting them.

Additional investments required

- Increase the allocation of SR&ED credits, which have dropped significantly (by nearly 50% in 5 years) over the past few years
- New refundable salary credit program for companies of all sizes

Helping to meet the LS industry's goals

- Create a favourable and predictable environment supportive of start-ups and business development as well as of foreign investment
- Create an environment that supports innovation
- Develop an additional competitive advantage for Quebec with the tax credit for the production of intellectual property in life sciences

Impact and benefits

- Increase in investments
- Increase in foreign investments
- Positive impact on the ecosystem's development
- High value-added job creation

RECOMMENDATIONS

ACCESS TO CAPITAL *(cont.)*

1b. IMPROVE THE CAPITAL AVAILABLE FOR THE SEED PHASE

Access to capital

Entrepreneurs and mentoring

Develop a non-dilutive loans and seed subsidy program: Create a funding envelope for loans and subsidies to companies in the seed phase, without requiring the participation of an academic institution. Based on the Massachusetts Life Sciences Center's loans and grants program, it would allow investors' investments to retain their value over a longer period and limit their dilution while increasing the capital made available for investment purposes.

Provide a tax credit to angel investors: Give a tax credit to angel investors in the life sciences industry to encourage investment and decrease risk-taking in this sector. Based on similar programs in British Columbia and Massachusetts, the portion of the investment covered by this tax credit could increase gradually depending on the level of risk associated with the development phase.

Use high performing venture capital funds to guide seed investments: Identify the most successful life sciences venture capital funds in Quebec, then provide them with government financing that can only be used by young seed-stage organizations to lower the risk at this crucial stage of development. High performing venture capital funds could be assessed based on their performance history and life sciences success stories. Financing should be provided on a regular basis so that it remains impervious to policy shifts.

Additional investments required

- Create a $20 million funding envelope over 4 years for loans and subsidies for the seed stage
- Tax credit specifically for life sciences angel investors
- Finance seed investments with a new $50 million fund over 10 years

Helping to meet the LS industry's goals

- Launch and develop businesses
- Develop entrepreneurship
- Support the launch and growth of 40 companies through operations being conducted through 2022
- Reinforce mentoring
- Increase in venture capital investments

Impact and benefits

- Increase in investments. In Massachusetts, the Accelerator Loan program's investment impact totalled $252 million, which supported 32 companies for up to $23.3 million
- Positive impact on the ecosystem's development
- High value-added job creation
- Significant economic benefits and tax revenues

RECOMMENDATIONS

ACCESS TO CAPITAL *(cont.)*

1c. IMPROVE THE CAPITAL AVAILABLE FOR PHASE II AND III CLINICAL DEVELOPMENT AND FOR MARKETING

Access to capital | Marketing | Animal health

Promote the establishment of a late-stage fund: Promote the creation of a Canadian investment fund with sizeable financing ($300 to $500 million), whose main objective would be to limit the exodus of organizations conducting phase III clinical development and facilitate the marketing of technologies developed in Quebec. This fund's mission should be to support both animal health and human health companies. Fewer funds are required by animal health companies in phase III and in the pre-marketing or marketing phase than by human health companies. A minimum of $50 million of this late-stage fund should be allocated to animal health.

Examine the possibility of the Quebec government acquiring innovative financial tools to finance life sciences: In 2018, the Ministère des Finances du Québec put a fixed-rate green bond program in place for the savings and retirement products it offers through Épargne Placements Québec. Reproducing a similar model in the life sciences industry could encourage investments in funds of funds.

Continue to invest in venture capital fund funds: Serves to encourage existing high-performance funds as well as the creation of new funds through investments in funds of funds, namely through Investissement Québec (IQ) and Teralys.

Additional investments required

- $150 million in venture capital investments to participate in life sciences investment funds, including an amount allocated to animal health
- These investments may even be made within Investissement Québec's existing and scheduled venture capital funding envelopes

Helping to meet the LS industry's goals

- Increased retention of life sciences paragons
- Increase in foreign investments
- Increase in venture capital investments in the industry
- Attract and support private industrial projects valued at more than $500 million by 2022

Impact and benefits

- Significant economic benefits and tax revenues by retaining the paragons
- Profitable capital investments for both governments and venture capital funds because life sciences funds offer excellent returns at this stage of development

RECOMMANDATIONS

ACCESS TO CAPITAL *(cont.)*

1d. IMPROVE LIFE SCIENCES ORGANIZATIONS' ACCESS TO CURRENT PROGRAMS

Access to capital | Labour force | Foreign investment

Redefine eligibility criteria for current generic subsidies: Life sciences organizations don't participate much in generic subsidy programs[1] other than SR&ED credit programs and IRAP. The eligibility criteria for these programs should therefore be redefined so that life sciences organizations are not penalized for their long development period (during which they are without any revenues). A "life sciences" clause could be added to these programs' eligibility criteria. One of the criteria could be based on already having secured private financing, which normally indicates a project's potential and importance.

Facilitate access to BioMed Propulsion: Decrease the number of requirements and constraints for the Biomed Propulsion financing program. Although the available budget is sizeable ($100 million as debt), this program has been underutilized since its inception, with only a few companies having made use of it. This program, which has many limitations, requires companies to pay a premium in the form of a stock option or share purchase option calculated at a minimum threshold of 15% of the loan to offset the risk. Recognized as one of the more appealing programs currently available, reducing the number of requirements and restraints would make it much more accessible and helpful for the industry's development.

Additional investments required

- Greater participation of life sciences organizations in generic programs
- No additional investment in BioMed Propulsion because the funding envelope has already been announced but was used by only a few companies

Helping to meet the LS industry's goals

- Launch and develop businesses
- Increase in venture capital investments
- Attract foreign investment
- By 2022, be the province that attracts the most investments in clinical research
- By 2027, be the province that attracts the most investments in private research

Impact and benefits

- Retention of paragons at an important stage of development
- Significant economic benefits and tax revenues

Note: Examples of generic programs (partial list): the BDC's small business loan program for companies that have been generating revenue for 24 months, the CanExport program requires revenue of more than $200 000, Canada Small Business Financing Program requires current annual revenue, Innovative Manufacturer Financing requires $2 million in revenue, etc.

RECOMMENDATIONS

LABOUR FORCE

2. IMPROVE ACCESS TO HUMAN CAPITAL TO SUPPORT THE INDUSTRY'S GROWTH

Labour force | Entrepreneurs and mentoring

Enhance methods for attracting highly qualified life sciences talent: This report does not question the quality of researchers available in Quebec, but highly qualified international talent must be recruited for some very specialized areas of expertise. Researchers with such specialized skills and knowledge are hard to find. This is a worldwide concern. For Quebec to be successful in attracting the top life sciences specialists, it is essential to implement measures to attract these scientists. Certain organizations, such as Montreal International and Québec International, have already implemented effective recruitment initiatives, but the industry believes there is still room for improvement. To this end, one of Quebec's competitive advantages, the tax credit for foreign researchers, could be promoted more vigorously, simplified, and even improved. These changes could lead to more competitive working conditions compared to other prominent life sciences locations such as Massachusetts and California, which are competing to attract these highly skilled researchers from around the world.

Establish a wage subsidy program for the transition from academia to industry: Establish a wage subsidy program for university researchers in the life sciences sector who are making the transition to industry. The transition from academia to industry involves a steep learning curve in all fields. However, this curve is more noticeable in life sciences: stakeholders have observed that the transition is particularly difficult for the first year. A new program would subsidize the first year of salary for researchers making the leap to working in the industry. In exchange for receiving the subsidy, a company would commit to acclimatizing the university researcher to the realities and challenges of the industrial life sciences sector, namely by paying for specific training such as the one offered by the CDRD Academy[1] (now adMare BioInnovations) in Vancouver or the Life Sciences Entrepreneurship Development Program (a collaboration between Montréal InVivo, the Faculty of Pharmacy at Université de Montréal, and Concordia University's John Molson Executive Centre).

Additional investments required

- More support for organizations' life sciences talent recruitment efforts
- Investment in a program for university researchers and graduates transitioning to industry

Helping to meet the LS industry's goals

- Attract foreign talent
- Develop and retain talent
- Develop entrepreneurship and mentoring
- Support the launch and growth of 40 companies through operations being conducted through 2022
- The foreign researchers' tax credit is a competitive advantage for Quebec

Impact and benefits

- Economic benefits and tax revenues from researchers' and graduate students' salaries
- Business development

Source: **1-** CDRD, "The CDRD Academy" (https://www.cdrd.ca/cdrd-academy/)

RECOMMENDATIONS

ACCESS TO THE LOCAL MARKET

3. IMPROVE ACCESS TO THE LOCAL MARKET AND INTEGRATE INNOVATION

Access to the local market | Foreign investment | Animal health

Ensure market access and integration of innovation: Maintain efforts to implement the QLSS' measures for improving market access and integrating innovation while ensuring that the Bureau de l'innovation can produce at least five technology showcases per year. To this end, increasing the resources assigned to life sciences and biotechnology applied to human and animal health in the Bureau de l'innovation's team should be considered so that the objectives are met.

Take advantage of Quebec's unique context of biological, clinical, and administrative data and a world-class artificial intelligence ecosystem to develop precision medicine and real-world care research capacities: Develop data management policies to exploit the enormous potential of the various biological, clinical, and administrative databases while making sure that the artificial intelligence ecosystem is implemented in the health system.

Additional investments required

- Increase personnel at the Bureau de l'innovation
- Investments already outlined in the QLSS, notably for developing precision medicine research capacities •Develop data management policies

Helping to meet the LS industry's goals

- Increase in foreign investments
- To be, by 2027, the province that attracts the most private investments in research
- Produce at least five technology showcases per year for the next five years
- Increase in the number of supported projects involving real-life care situations
- Strengthen the promising precision medicine niche

Impact and benefits

- Increase in foreign investments
- Increase in economic benefits from investments resulting from better access to the local market

4. SPECIFIC RECOMMENDATIONS FOR THE ANIMAL HEALTH SEGMENT

Animal health | Foreign investment

Support the launch and acquisition of animal health companies

With fewer than a dozen animal health biotechs in Quebec, and despite the presence of world-renowned researchers, the province is far from having a critical mass of companies. An enhanced financial environment through measures similar to those in the human health field would make it easier to launch businesses locally and lead to the acquisition of foreign companies by Quebec businesses. A critical mass of companies would then be formed, creating a more complete ecosystem that is both competitive internationally and attractive to investors. To this end, including animal health investments from a Canadian late-stage fund would to contribute to developing the segment's paragons. It would be important for there to be greater awareness of the government's animal health programs, such as BioMed Propulsion and the Innovation Program.

Improve the animal health products approval process: As an animal health company's value is only established once the approval of its products (such as vaccines and other biotechnologies) by the federal government is finalized, these companies must receive financing prior to this step. As such, there is a need to standardize and make the approval process for animal health products and the accreditation of research facilities more predictable. **To test products being developed, there is also an urgent need for an accredited CRO (which would include an animal facility) to be launched in Quebec**. This could be a very interesting way for the Quebec government to attract strategic foreign investment to meet market needs and to develop the Quebec animal health ecosystem. Improving local public and private investors' knowledge of animal health and their understanding of these specific issues would contribute to financing companies earlier in their product development phases and until the time they are approved. Once approval has been obtained, promoting distribution agreements with international partners who already register products overseas would be required for marketing products in foreign markets that are often much larger than Canada so that Quebec could control and keep sales revenues in the province.

Additional investments required

- Venture capital investments to participate in life sciences investment funds, including an amount allocated to animal health (minimum of $50 million for a late-stage fund)
- Support the launch of a CRO with an animal facility for product testing and development by teams assigned to attract foreign investments
- Improve and standardize the federal animal health approval process

Helping to meet the LS industry's goals

- Support the development of up to five high potential paragons by 2027
- Retain world-renowned researchers
- Strengthen the ecosystem
- Market internationally
- Attract and support private industrial projects valued at more than $500 million by 2022

Impact and benefits

- Foreign companies being acquired by Quebec ones
- Develop a critical mass of companies
- Attract foreign investment

THANK YOU TO OUR **PARTNERS**

charles river

QUÉBEC INTERNATIONAL
Développement économique

Biovet®

Feldan Therapeutics

FONDS de solidarité FTQ

Prevtec microbia

THERA technologies

APPENDIX A

LIST OF INDIVIDUALS AND ORGANIZATIONS INTERVIEWED

APPENDIX A (1/2)
LIST OF INDIVIDUALS AND ORGANIZATIONS INTERVIEWED

NAME OF ORGANIZATION	LOCATION	NAME OF INDIVIDUAL	TITLE
AmorChem	Montréal	Élizabeth Douville	Co-Founder and Managing Partner
Amplitude Ventures	Montréal	Jean-François Pariseau	Co-Founder and Partner
BDC	Montréal	Jérôme Nycz	Executive Vice President
CLSA - California Life Sciences Association	California	Brett Johnson	Senior Director of Policy and Regulatory Affairs
CLSA - California Life Sciences Association	California	Oliver Rocroi	Vice President, State Government Relations
CQDM - Consortium québécois sur la découverte du médicament	Montréal	Diane Gosselin	President and Chief Executive Officer
CTI Sciences de la vie	Montréal	Jean-François LePrince	Managing Partner
Fonds de solidarité FTQ - Sciences de la vie	Montréal	Didier Leconte	Vice President, Investments – Life Sciences
Investissement Québec	Montréal	Paul Buron	Executive Vice-President, Government Mandates and Programs Management
Life Sciences Ontario	Ontario	Jason Field	President
MEDTEQ	Montréal	Diane Côté	Chief Executive Officer
Montreal International	Montréal	Christelle Fasano	Director, Life Sciences - Investments
Montréal InVivo	Montréal	Frank Béraud	Chief Executive Officer
North Carolina Biotechnology Center	North Carolina	Laura Rowley	Director of Life Science Economic Development
Québec International	Québec	Carl Viel	President and Chief Executive Officer
Teralys Capital	Montréal	Cédric Bisson	Partner
TVM Capital Life Science Venture Capital	Montréal	Luc Marengere	Managing Partner
Univalor	Montréal	Jacques Simoneau	President, Chief Executive Officer, and Director

APPENDIX A (2/2)
LIST OF INDIVIDUALS AND ORGANIZATIONS INTERVIEWED

NAME OF ORGANIZATION	TYPE OF ORGANISATION	NAME OF INDIVIDUAL	TITLE
BIoAuxilium	CRO	Jaime Padros	President
BioK+	Biotech	Isabelle Chevalier	President
BioK+	Biotech	Pierre Falardeau	Chief Innovation Officer
Biospective Inc	CRO	Michelle Lallier-Davies	Director, Administration and Quality Control
BioVet	Animal health	René Lallier	President
Caprion	Biotech	Martin Leblanc	President
Charles River Laboratories	CRO	Michel Provence	Corporate Vice-President - Canada
Charles River Laboratories	CRO	Carmela Parente	Director – Toxicology
Charles River Laboratories	CRO	Véronique Cyr	Director - Finance
Charles River Laboratories	CRO	Pam Walker	Corporate Vice President
Coréalis Pharma	CRO	Patrick Gosselin	Vice-President R&D
Coréalis Pharma	CRO	Yves Roy	President
Diex Recherche	CRO	Nicole Sirois	Director – Finance and Human Resources
Diex Recherche	CRO	Suzie Talbot	Chief Executive Officer
Engene	Biotech	Jason David Hanson	President and Chief Executive Officer
Feldan Therapeutic	Biotech	François-Thomas Michaud	President & CEO
Immune BioSolutions	CRO and Biotech	Frédéric Leduc	President & CEO
Inixium Recherche	CRO	James Fethiere	Chief Scientific Officer
Kisoji Biotechnology	Biotech	David Young	President
Neomed LABS / Ad Mare BioInnovation	CRO	Pierre-Yves Desbiens	Chief Operating Officer
Precision for medicine	CRO	Ken Boudreault	Senior Clinical Research Associate
Prevtec Microbia	Animal health	Michel Fortin	President and Chief Executive Officer
Repare Therapeutic	Biotech	Lloyd Segal	President & CEO
Theratechnologies	Biotech	Luc Tanguay	President & CEO

Deloitte.