

Life sciences and health technologies

A wealth-generating sector and a creator of prosperity for Quebec



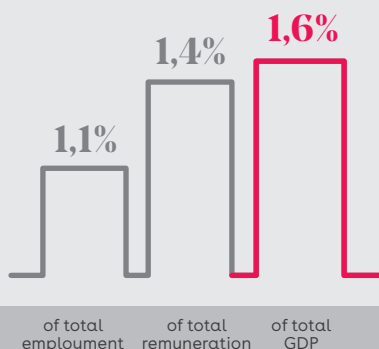
The Chamber of Commerce
of Metropolitan Montreal

Highlights

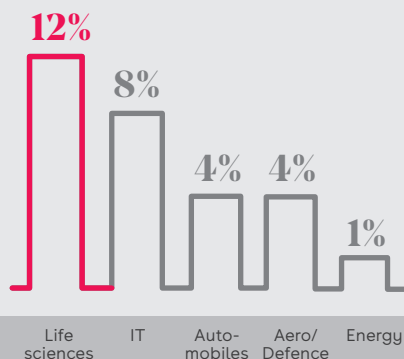
of the life sciences and health technologies sector (LSHT)

A critical sector for Greater Montréal and Quebec

Impact of LSHT in Quebec (2014)



R&D as a % of revenue (2014)



A cluster that
generates wealth



a **\$5.6** million
contribution

Source: Montréal InVivo and Statistics Canada, 2015

A decisive number of jobs

comparable to the aerospace sector

56,000 **=** **80%**
jobs in the value chain in Greater Montréal

\$70,000

average salary

A high concentration of companies in Quebec

609 **45%**
companies (2014) of head offices of Canadian subsidiaries of major pharmaceutical companies are in Quebec.

Montréal's relative advantages

- Internationally recognized hospitals and university hospital centres
- Talent pool
- World-class research centres
- Business environment

Source: Montréal InVivo, 2016

The LSHT sector worldwide

5% to 9%

annual growth
according to the sector (2014 to 2018)

US \$1,950

billion in revenue
worldwide
(2014)

This phenomenal growth is explained by 3 main factors

Increase

in demographic aging and chronic diseases

Expansion

of emerging markets

Poorer

health among the population

30%

growth
(2008 to 2014)

US \$200

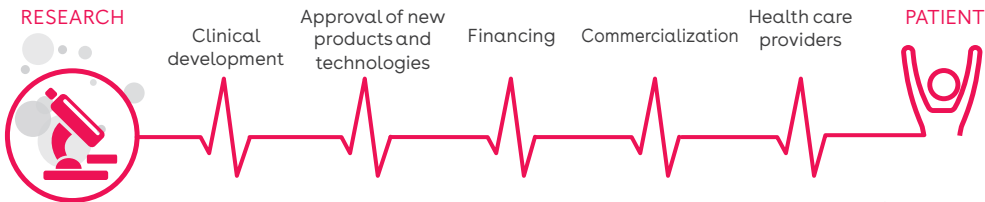
billion in
R-D
spending

2nd

most active
sector in R&D
globally

Source: SECOR-KPMG for Montréal InVivo, 2015

Simplified LSHT value chain



Source: Montréal InVivo, 2016

Big data: 25% annual growth worldwide

Companies now have access to an incredible volume of data. Big data is a process of exploiting data that involves collecting, analyzing and implementing value-generating solutions.

\$213 million
in grants from
the Canada First
Research Excellence
Fund

in 2016 to Montréal institutions, including the Institute for Data Valorization (IVADO), will have a major impact on R&D and the sector.

LSHT: one of the primary sectors using big data

Big data is a definitive breakthrough in the advance of the discovery of drugs and personalized medicine.

Quebec's big data ecosystem is highly dynamic and built on several pillars.

- Two Montréal clusters: life sciences and information technology
- An active scientific community
- A public health care plan that offers access to a critical mass of data

Source: Montréal International - Québec International, 2016

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Four LSHT subsectors of activity

Portrait of an industry

Pharmaceuticals

Montréal is one of the few cities where a drug can go through every stage of development: research, production, commercialization and preclinical and clinical trials.

Health care technologies

- The most active in business and job creation
- Montréal is the ideal place for activities in this sector, because it is a centre for the ICT, LSHT and engineering sectors

44%

*jobs are in
pharmaceuticals
and medical
technologies*

Manufacturing/contract research organizations (CRO)

- Key link in the LSHT innovation chain
- Sales of \$500 million
- 73% growth in jobs forecast by 2019 – value added per direct job of 75%

*Organization
that specializes
in the research and
development of health
products, services
and technologies*

*Biotechnology companies
use innovative methods
drawn from research
conducted in biology and other
fields such as engineering,
genetic engineering, computer
technology and chemistry.*

Biotechnology

- \$468 million annual contribution to GDP
- \$155 million in provincial and federal tax and parafiscal revenue annually
- \$3.5 million in added value per biotechnology company

Sources: BioQuébec, 2016; Montréal InVivo, 2016

Genomics

A revolution for LSHT sectors

The cornerstone of modern biotechnology

Genomics has a role to play across sectors and in every part of the innovation chain. This leading-edge technology is the source of a great deal of transformation, including LSHT business models. Genomics is one of the backbones of personalized medicine.

Genomics has many applications, which are promising not only for LSHT, but also for key sectors such as agri-food, forestry and sustainable development.

Génome Québec

With \$850 million in activities to date, Génome Québec is the largest organization that finances the development of genomics in Quebec. Montréal is one of the Canadian leaders in this area.

Source: Génome Québec, 2016



A close-up, slightly blurred image of a microscope with a slide, serving as the background for the top section.

Ranking the LSHT sector

Quebec among the top 15 centres in North America

1st

Costs

place for low operating costs for LSHT businesses:

- competitive incentives
- competitive corporate tax rates
- competitive real estate costs

1st

Innovation

place in Canada for:

- the number of patents
- public research funding
- total R&D spending as a percentage of GDP

4th

Economy

place for its ability to attract major direct foreign investment

6th

place for the number of LSHT businesses and institutions

6th

Talent

place for number of LSHT Ph.D. graduates

7th

place for concentration of jobs

Source: Montréal International, 2016

3 promising drivers

to become one of

the top 5

LSHT centres in
North America

A targeted,
ambitious
government
strategy
for integrating
players

A strong venture
capital industry
to finance innovative
businesses

A health care system that
promotes integration
and innovation,
particularly for locally developed
technologies

To improve
its performance,
Quebec needs:



Source: Montréal InVivo, 2016

Quebec has the potential to become
one of the top 5 centres through:

- its know-how in R&D
- its competitiveness on costs, taxation and government incentives
- its ability to attract foreign investment
- the strength and diversity of its ecosystem



Portraits of LSHT leaders

The LSHT sector is characterized by vitality and multiplicity. Since the beginning of the 2000s, industry players have adopted new business models. Companies rationalized and decentralized their R&D activities. The ecosystem moved toward strong niches where scientific and industrial partnerships are on the rise. The rapid emergence of health care technologies, personalized medicine and genomics are also sources of innovation for industries.

Greater Montréal is an incubator for talent, where a critical mass of entrepreneurs, researchers and investors come together to develop the medical treatments and technologies of tomorrow.



Here are five businesses that have made their mark in the industry and that illustrate these changes to the business culture.

An innovative SME making the shift to personalized medicine

CAPRION

MARTIN LEBLANC

President and CEO

Caprion, which opened its doors in Montréal in 2000, is a leader in the discovery of proteomic biomarkers. Its leading-edge technology platform improves the accuracy of screening tests, diagnoses and drug responses.

"Drugs on the market work for less than 40% of patients. In the case of cancer, that number plummets to 25%. Personalized medicine, supported by advances in genetics, is transforming our sector. **Caprion harnesses that potential, because our innovative approach makes it possible to determine which population the drug will have the desired effect for.**"

"Caprion has garnered attention for its niche technology that is adapted to the needs of our clients, mainly pharma, for whom research with biomarkers is an expanding practice. Our annual growth of 25% to 30% since 2010 attests to this."

Tips for SMEs that want to

innovate



Competition is fierce in our sector: an SME that wants to take the plunge has to leverage innovation that addresses market needs

60% of **our team** has a master's degree or a doctorate: **build a highly skilled team to maximize your ability to innovate**

A CRO that is part of the new business environment

COREALIS Pharma

YVES ROY

President

"You need to find your niche and build a strong network."

Founded in 2005, COREALIS Pharma operates in formulation development and clinical supplies manufacturing of solid oral dosage forms. **"The 2000s brought changes to the business environment.** Pharmaceutical companies cut back on internal R&D, preferring to acquire drugs at later stages of development. Our CRO is part of that trend, supporting biotechnology companies that take risks at the early stages, passing the torch to pharmas that buy the drugs and pursue clinical studies."

You need a solid business strategy and your clients' trust to succeed. Human capital is what drives our activities, and **we prefer sustained but controlled growth** so that we can train new employees properly. We don't have external investors; that way we decide how we grow."

Tips for adapting and

prospering

Protect your corporate culture and don't let overly rapid growth swamp your employees

The industry will hear about your failures faster than your successes, so it is important to have the strictest standards



A model of growth and exports

KINOVA

STUART KOZLICK

Senior Director of Medical Device Strategy, Innovation and Quality

Tips for succeeding on

foreign markets

Think bigger, broader and longer term: SMEs need to focus their efforts to showcase our know-how internationally

Take risks: don't be afraid of challenges and failures, because they are what generate progress

Created in 2006, Kinova develops and produces robotic platforms. Its unique technology for robotic arms improves mobility and quality of life for patients who have lost the use of their arms. **"Our goal is to advance human abilities through robotics.** We produce for the medical and the industrial sectors, and we have Google, Amazon and NASA as clients and partners."

In 2016, Kinova was ranked 16th in the PROFIT 500 thanks to 4,389% growth over five years. "Ninety-five percent of our sales are from exports. Europe is a major market for assistance robots, particularly the Netherlands, because insurers reimburse for them. We are working to have them recognized by Canadian insurers, to benefit patients and the public health care system, which will see significant gains in the long term."



An incubator that offers partnerships
and financing capacity

The NEOMED Institute

The result of a private-public partnership, NEOMED is a bridge between basic research and new drug commercialization.

"Our sector involves risk and requires massive investment, so profitability depends on the length of patents. Developing a drug costs an estimated billion-plus US dollars and involves 15 years of work."

NEOMED helps projects transition between stages of research, clinical development and medical application. We are the link between academia and industry. We support R&D up to a stage where projects are attractive for biopharmaceutical companies, which then take them to the next stages."

"Ultimately, NEOMED promotes innovation with the goal of keeping expertise, value creation and companies in Quebec."

PHILIPPE WALKER
Ph.D., Chief Scientific Officer

"Joining forces to take projects further and maximize their economic benefits"

Possible solutions for
partnerships and
financing
in the industry

"Partnering and working in synergy to create solid financial leverage to bring as many innovative projects as possible to maturity."



An international pharmaceutical company that
supports innovation in the Montréal ecosystem

SERVIER CANADA

FRÉDÉRIC FASANO
President and CEO

Possible solutions for increasing Quebec's
attractiveness

Streamline ethical and contractual procedures around clinical studies conducted in Quebec

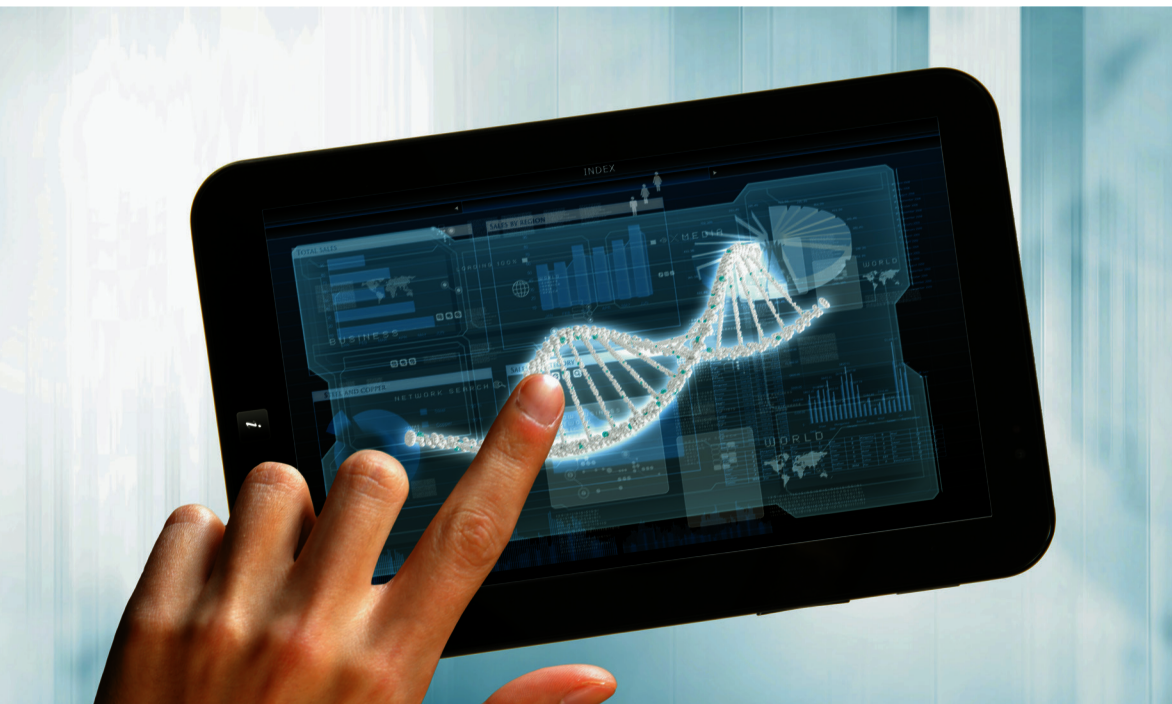
Provide better coordination between Quebec university hospitals to increase recruitment potential, speed of execution and the quality of data from clinical protocols

Step up promotion research centres internationally



Servier is the leading independent French pharmaceutical group worldwide. Its Canadian subsidiary, located in Greater Montréal since 1978, coordinates research into and the commercialization of innovative drugs. "Servier is a private company held by an international research foundation. **Our business model is distinctive, because we invest 25% of our revenues in R&D – one of the highest rates in the world.**"

Quebec's leading attractiveness factor is the quality of its R&D teams. **We develop our products in 140 countries, and Canada stands out for its advanced research at every stage of development. The second advantage is our ecosystem, which is based on a chain of value-creating members."**



Main partner for the initiative

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