

Poised for growth

Canada's life sciences sector
in a post-COVID-19 world

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Canada's life sciences sector

Introduction

Canada's life sciences sector is an important contributor to the country's innovation and broader economy, that extends across the research, development, and manufacturing fields. Stakeholders range from small to medium-sized to global companies involved in the development of diagnostics, biopharmaceuticals, pharmaceuticals, and medical devices, serving the domestic and international markets.

Canada is home to a large pool of highly skilled life sciences professionals with a broad range of expertise and offers an ecosystem for life sciences companies to thrive which includes first-class academic institutions, research networks, partnership opportunities and an increasingly favourable funding environment.

In 2020, the three largest IPOs ever by domestic life sciences companies in Canada were filed, including that of AbCellera Biologics (AbCellera) – a Vancouver start-up that is now the most valuable Canadian biotech company ever. And the potential exists to grow other companies and turn Canada's life sciences sector into a global competitor.

As Canada comes out of the pandemic, the gradual improvement in economic conditions, increased demand for health care spending, aging demographics, and the nation's focus on economic self-sufficiency in areas such as pharmaceuticals, all bode very well for the domestic life sciences sector.

Canadian quick stats

\$2.2B

2021 Federal Budget contribution towards life sciences and bio-manufacturing sector over seven years

Source: Statistics Canada: 2021 Budget

Big 10

The world's ten largest biopharmaceutical companies have a presence in Canada

Source: InvestCanada

26%

Life Sciences' share of total VC investment in 2020 – up 10% year-over-year

Source: CVCA 2020

5%

Canada captures 5% of the world's clinical trials, ranking ninth globally

Source: InvestCanada

58%

Canadians aged 25-64 having graduated from post-secondary institutions – one of the world's best-educated talent pools

Source: OECD 2020

The awakening

The pandemic has understandably led to a focus on medical facilities and life sciences – and a desire not to be overly dependent on a single supplier, country or geography. The aim of decreasing foreign dependencies may lead to a growing trend to onshore production and strengthen the domestic supply chain. Venture capital funding for medical research has increased substantially with medical infrastructure and R&D spending now increasingly seen as relevant to national security, and demand for lab space is likely to increase.

Meanwhile, the commercial real estate sector will play a critical role in maximizing the efficiency and results of the life sciences sector across the country. More importantly, Canada is not yet manufacturing a COVID-19 vaccine and that sets the stage for more life sciences facilities, so developing companies and experienced workers do not look elsewhere to expand and work in the field.



Government support

The federal government has been criticized for its decision to source its COVID-19 vaccine supply from other countries' production facilities. However, the importance of Canada's life sciences sector goes beyond responding to the pandemic. This is a growing sector that supports thousands of middle-class jobs. The goal is for Canada to become a more attractive and globally competitive place for investment to ensure a more robust domestic life sciences sector.

The 2021 Budget allocates a total of \$2.2 billion over seven years for the life sciences and bio-manufacturing sector – funding that will help build and keep talent and research systems, and support the growth of Canada's life sciences companies.

Notable funding includes:

- \$1 billion on a cash basis over seven years, starting in 2021-22, of support through the Strategic Innovation Fund would be targeted toward promising domestic life sciences and bio-manufacturing firms.
- \$500 million over four years, starting in 2021-22, for the Canada Foundation for Innovation to support the bio-science capital and infrastructure needs of post-secondary institutions and research hospitals.
- \$500 million over five years, starting in 2021-22, and \$100 million per year ongoing, to expand the Industrial Research Assistance Program to support up to 2,500 additional innovative small and medium-sized firms.

A favourable funding environment

Venture-capital (VC) investment in the life sciences sector is vital to the Canadian economy and has been a catalyst for many now-thriving Canadian companies. According to the Canadian Venture Capital and Private Equity Association (CVCA), new VC investment in Canada during 2020 reached \$4.4 billion across 509 deals – second only to 2019.

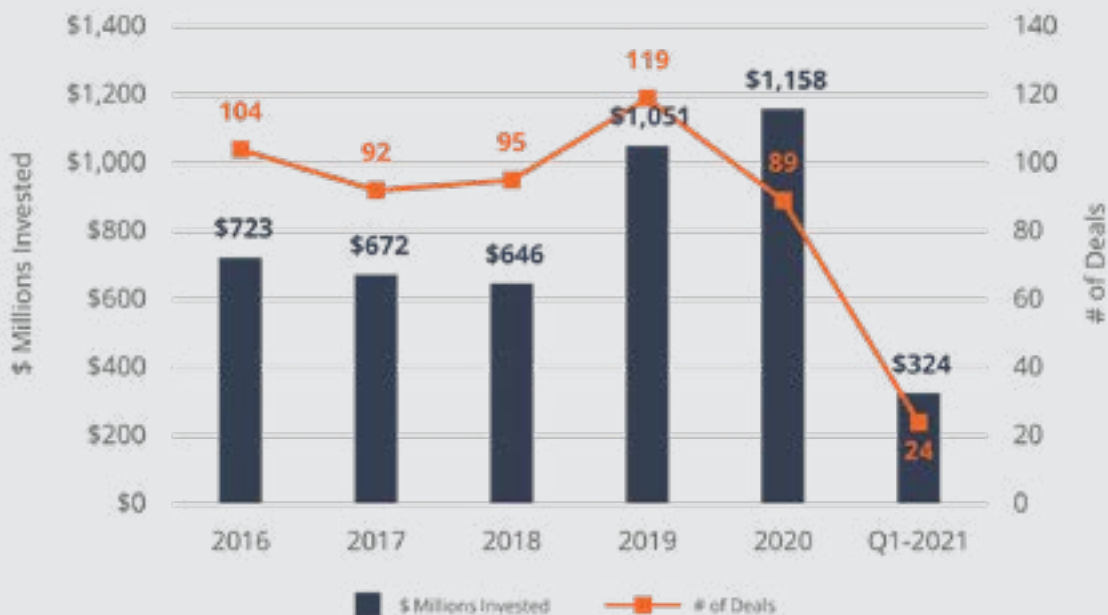
Life Sciences companies received slightly more than one-quarter or a 26% share (\$1.1 billion over 89 deals) of the total dollars invested in 2020, a 10% increase from 2019 – second only to Information, Communications & Technology companies, which received 55% of total VC funding (\$2.4 billion across 284 deals) – up 40% year-over-year. For perspective and according to CB Insights, global health care funding hit a new quarterly record in the first quarter of 2021 – US\$31.6 billion.

The top three provinces by number of VC investment deals in the life sciences sector in 2020 were Ontario (35 deals or 39% share), Québec (30 or 34%), and British Columbia (12 or 13%) – capturing 77 life sciences deals, or 86% of the total across the country.

Three of the top 10 VC deals in 2020 were attributable to the life sciences sector – all three going public on NASDAQ – including Vancouver-based biotech company AbCellera, the largest exit in 2020 and largest exit on record for life sciences in Canada with a market cap of \$6.7 billion; followed by Montréal-based cancer-drug developer Repare Therapeutics (\$1.5 billion) and Fusion Pharmaceuticals (\$959 million), based in Hamilton, part of the Greater Toronto and Hamilton Area (GTHA).

Canada's life sciences sector kicked-off 2021 on a strong note with \$324-million in first-quarter funding (12% of the \$2.7 billion VC total) across 24 deals – on pace for a third consecutive \$1-billion-plus year. Ontario led with eight deals (33% share), followed by British Columbia and Québec with five deals each (21%). Meanwhile, two life sciences firms made the top 10 VC list: Notch Therapeutics (\$108 million) and Corvista Health (\$65 million), both Toronto based, while Montréal-based Dialogue Health Technologies's went public (\$779 million) on the TSX.

Canada life sciences VC investment



Source: CVCA 2021

The hubs

The three primary life sciences markets in Canada are Toronto, Montréal and Vancouver. Hamilton – an extension of the Greater Toronto Area (GTA) – is also an emerging hub, and Calgary is home to Biospace 1, a new facility catering to advances in health, wellness and biomedical innovation opened by DynaLife Medical Laboratories and Biohubx in Royal Vista in the city's northwest. Across the country, unprecedented investment by the federal government is already being deployed to help expand, finance, or build new lab space, including:

- AbCellera, a Vancouver-based biotech company, is expanding into two new purpose-built office/lab buildings comprising more than 380,000 square feet (sf) in Mount Pleasant with the vision of creating a large-scale biotech campus.
- In March 2021 and in partnership with the federal, provincial, and municipal governments, Sanofi announced an investment of approximately \$925 million in a new vaccine manufacturing facility at its existing site in Toronto – due to open in 2026.
- In May 2021, the federal government announced a \$200-million investment in Mississauga-based Resilience Biotechnologies to expand capacity for vaccines and therapeutics, including mRNA shots.
- In Hamilton, the McMaster Innovation Park, associated with McMaster University, is evidence of growing demand in the GTHA region – adding more than 2 msf of new life sciences space – doubling the park's space year-over-year.

- Financing construction of the \$126-million Biologics Manufacturing Centre adjacent to the National Research Council's Biotechnology Research Institute on Royalmount Avenue in Montréal – scheduled for completion in summer/fall 2021. This financing is a huge boost for the market, given that labs are typically up to three times more expensive to build than other commercial real estate, such as office and residential space.
- In the Greater Montréal Area (GMA), the City of Laval and the National Institute of Scientific Research are launching Phase II of Biotech City – adding up to 1.2 million square feet (msf) of additional life and health sciences development to an existing 13-msf science park.



Not your ordinary premises

The biggest cost for most companies is either employees or real estate, and this no different for life sciences firms, as lab space is very expensive. Most early-stage life sciences work is project-driven and done in a lab (wet or dry) and once at the proof-of-concept or trial stage, the need for premises can change quickly. In addition to lab space for ongoing research, life sciences companies' needs will shift to mass-manufacturing and distribution capacity. In the end, life sciences facilities are complex buildings that can be costly to retrofit, build and operate – creating barriers to entry for both new premises development and conversions.

However, the limited supply in some markets and potential growth of the life sciences sector may become so compelling

that some owners may start to convert traditional office buildings into lab premises. This could be fuelled by the uncertainty in the office – and even retail – markets, which is making it more and more appealing for building owners to consider the possibility, despite the specific requirements and costs associated with this type of space.

Undertaking such an investment means these extraordinary costs often need to be amortized over a longer period, so owners may not receive an immediate return with their first tenants. On the plus side, higher fit-out costs than for traditional office space mean these specialized facilities will attract significantly higher rents down the road.

Notable costs for life sciences space include:



Heating, ventilation, and air conditioning (HVAC)

More HVAC than a traditional office due to higher ventilation requirements and the need for different types of airflow in different spaces of a life sciences facility – which also means higher ceiling heights to accommodate duct work.



Electrical systems

More power is required with backup generator support (e.g. to store samples in freezers) – not all buildings have enough power supplied to them to support a life sciences use.



Plumbing

Life sciences facilities tend to require more sinks and highly filtered water, often needing on-site de-ionization systems and point-of-use ultra-purification.



Waste disposal

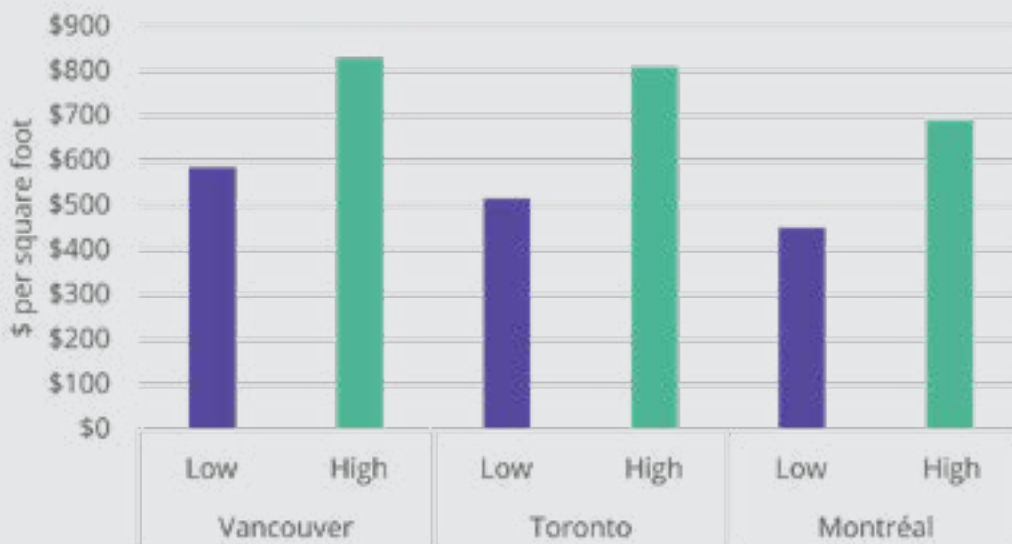
Much of the waste that labs generate (i.e. biohazardous and chemical waste) cannot be disposed of easily in municipal waste – requiring an outside contractor to dispose of the various waste streams.



Facility & equipment management

Managing the facility and specialized equipment such that work can continue uninterrupted is important and requires experienced staff – adding to the owner's overall operating expenses.

Lab construction costs



Source: Altus Group Canadian Cost Guide 2021



Vancouver

Life sciences rises in the west

British Columbia (BC)'s life sciences sector is in the midst of a substantial renaissance as a new class of firms moves to the forefront and re-establishes the best-in-class life sciences cluster that had originally taken root in the province during the 1990s. Back then, local heavyweights such as QLT, Inex Pharmaceuticals, AnorMed, Abgenix Biopharma, Angiotech Pharmaceuticals and Stemcell Technologies (which remains to this day and is the province's largest in terms of number of employees) helped establish BC's life sciences sector on the national and global stage.

While many of these companies no longer exist, the legacy they left behind provided a fertile foundation for the next generation of biotechnology firms that have grown in place today. This vibrant ecosystem was originally supported by locally based venture capital firms, including GrowthWorks, Ventures West and the BC Advantage Fund through 1990s and into the 2000s, which helped the sector grow and flourish. However, by the end of the 2000s, much of BC's life sciences sector had slipped off the radar after being acquired or going out of business. However, educational institutions such as the University of British Columbia (UBC) helped support and incubate the next generation of firms that have since come to dominate the Canadian life sciences scene in recent years. According to Ali Ardakani, vice-chair of Life Sciences BC, in a February 2021 column for *Business in Vancouver* newspaper, the "critical difference between current and past biotech companies is that current successful organizations are mostly platform companies with broad pipelines and partnerships versus single product companies."

The recent rise in the sector's profile in both the province and in Canada has been rapid and profound and was supercharged by COVID-19 thanks to many of BC's life sciences companies being at the forefront of developing

innovative products, services and solutions to address the pandemic. Vancouver-based AbCellera, founded in 2012 out of a UBC lab, had the largest-ever IPO by a Canadian biotech company, raising more than US\$550 million in December 2020. And AbCellera is just one of a new cast of players in BC's burgeoning life sciences sector that includes three of the largest biotech companies in Canada with greater than \$1 billion in market capitalization: AbCellera, Aurinia Pharmaceuticals and Zymeworks. Other notable firms in BC include Kardiium, Amgen, Xenon Pharmaceuticals and Chinook Therapeutics. Venture capital firms such as Versant Ventures, BDC Capital and Quark Venture also continue to play an important role.



Vancouver quick stats

US \$555M

Vancouver-based AbCellera Biologics had the largest-ever IPO by a Canadian biotech company in 2020

\$2B

BC's biotech companies raised a record \$2 billion in 2020

18,000

People employed in life sciences in 2020, one of BC's fastest-growing sectors with employment increasing 5.9% from 2018 to 2020

3

Of Canada's largest biotech companies with market caps exceeding \$1 billion are located in BC

New development

Of lab space triggered by recent success of BC life sciences firms

Venture capital finding west-coast opportunities

According to the *BC Life Sciences Update 2021* produced by the Greater Vancouver Board of Trade and Life Sciences BC, BC's biotech companies raised a record \$2 billion in 2020. While private capital plays a very important role in the BC life sciences sector, federal and provincial government grants also help to support early-stage scientific innovation, as have a resilient network of educational institutions. UBC research has spun off more than 125 new life sciences companies, including AbCellera, Acuitas Therapeutics and Precision NanoSystems. BC's life sciences sector has recorded several notable deals since 2019.

Notable financing deals:

- December 2020 – AbCellera went public and raised US\$555 million — the largest-ever IPO for a Canadian biotech firm – and then in early 2021 received nearly \$200 million in royalty revenue for its COVID-19-fighting antibody co-developed with Eli Lilly & Co.
- September 2020 – Virogin Biotech completed Series-C financing for US\$62 million



The M2 building in the Main Alley development will be home to Zymeworks

Source: Westbank

Notable financing deals (continued):

- August 2020 – Chinook Therapeutics raised US\$106 million in private placement financing
- July 2020 – Victoria-based Aurinia Pharmaceuticals raised US\$200 million
- July 2020 – ESSA Pharma raised US\$49 million in public offering
- March 2020 – Burnaby-based Xenon Pharmaceuticals raised \$115 million
- January 2020 – Zymeworks completed a \$320.8-million public financing
- December 2019 – Neoleukin Therapeutics announced pricing of public offering: \$100 million
- December 2019 – Victoria-based Aurinia Pharmaceuticals announces US\$250 million in financing
- November 2019 – A2 Biotherapeutics, Innovative Targeting Solutions and former Amgen executive teamed up to launch A2 Biotherapeutics with Series-A financing: \$57 million
- November 2019 – Vancouver-based Sierra Oncology announced closing of financing for \$103 million
- September 2019 – Vancouver-based Terramera closed Series-B financing for \$60 million
- August 2019 – Vancouver-based Chinook Therapeutics raised Series-A financing totalling \$65 million
- June 2019 – Zymeworks announced closing of public offering valued at \$264 million

Sources: 1) Lifesciences 2020: Innovation in Motion A New Era, and 2) Business in Vancouver newspaper

Key players in the sector

BC's life sciences sector is unique in Canada in that the majority of large firms are not branch offices of global life sciences companies, which have historically located in Ontario and Québec. Those life sciences firms in BC that are part of large multi-nationals were typically local firms that were acquired.

Notable BC life sciences firms include:

- Stemcell Technologies
- Kardia
- AbCellera Biologics
- Zymeworks
- Amgen
- Xenon Pharmaceuticals
- Aurinia Pharmaceuticals
- Verathon Medical Canada
- Burrard Pharmaceuticals
- Aspect Biosystems
- bioLytical Laboratories
- ABM Applied Biological Materials
- Response Biomedical
- SignalChem Biotech
- Neovasc
- Kinexus Bioinformatics
- Chinook Therapeutics



Tale of the tape: BC's life sciences sector

According to the provincial government's June 2020 profile of the life sciences sector, there are approximately 1,120 companies in BC (categorized in three groups: "research testing and medical laboratories", "medical devices and equipment" and "drugs and pharmaceuticals.") Most of the companies (93%) have less than 50 employees. There were 18,000 people employed in the sector in 2020, which is one of BC's fastest-growing sectors with employment increasing by 5.9% between 2018 and 2020. The provincial life sciences sector, which is located primarily in Metro Vancouver, recorded almost \$5.4 billion in revenue and produced \$1.6 billion in GDP in 2018, according to the provincial government.

The province exported \$484 million in life sciences goods and services in the same year. BC's life sciences sector is the third largest in Canada in terms of sector employment, wages, revenue and GDP behind Ontario and Québec. Government support for the BC life sciences sector has largely come at the federal level with the province providing additional support through the \$100-million BC Tech Fund and by funding various institutional research centres, universities and other like initiatives as well as working closely with Life Sciences BC.

Impact on commercial real estate market

The specialized nature of lab and biotech space has led to a limited supply in BC due to high construction costs and the cyclical nature of the province's life sciences sector since the 1990s. While an initial effort in the 1990s to create a life sciences/tech hub along Great Northern Way in Vancouver, anchored by the then-new 160,000-sf head office of QLT at 887 Great Northern Way constructed in 1999, did not succeed at the time. However, the building has remained a key source of lab space for the many smaller companies that venture forth from the halls of academia and make up the majority of the sector.

According to the *Altus Group 2021 Canadian Cost Guide*, lab space costs between \$585 to \$830 per square foot to construct in Vancouver, surpassed only by data centres (tier III) as the most expensive form of development. In comparison, a class A office building up to 30 storeys in Vancouver is estimated by Altus to cost \$270 to \$340 per square foot to build. Converting existing vacant office space, which was already at a premium pre-pandemic and typically unable to accommodate the required ceiling heights as well as mechanical and HVAC systems needed for lab space, has generally been considered too costly for many of the smaller early-stage life sciences companies in BC, many of which historically benefit from low overhead costs thanks to occupying lab space at local post-secondary institutions.



110 West 4th Ave

Source: AbCellera

Credit: Image provided by Francl Architecture



150 West 4th Ave

Source: AbCellera

Credit: Image provided by TKA+D

Leasing activity by life sciences firms in Metro Vancouver since 2017 has largely comprised small deals between 2,000 sf to 7,000 sf in Vancouver, punctuated occasionally by larger deals from heavyweights such as AbCellera, Zymeworks and Response Biomedical. More established firms such as Amgen and Stemcell Technologies, both with existing locations in Burnaby, have typically remained in place due to a lack of options elsewhere in the market and the costs associated with securing new premises. However, the recent successes of some of BC's largest life sciences firms have triggered new development.

In the case of AbCellera, the firm recently occupied a new build-to-suit development it preleased more than two years ago as well as kicking off construction of 380,000 sf of new office/lab space in 2021 with two additional build-to-suit projects. Zymeworks is the lead tenant in a new building scheduled for completion in the third quarter of 2021 with a prelease commitment of almost 80,000 sf. The success and increased profile of BC life sciences firms combined with the construction of the new \$1.9-billion St. Paul's Hospital and health campus, which kicked off in March 2021 and is set to open in 2026, is adding more lab space to accommodate the life sciences sector. The 11-storey hospital and surrounding medical precinct is located on 18.4 acres in Vancouver's False Creek Flats. It will provide additional lab and biotech space as part of the

Clinical Support and Research Centre (CSRC), part of phase two of the hospital's redevelopment and will reportedly accommodate approximately up to 680,000 sf of density on a 114,000-sf site. Additional mixed-use development projects surrounding the precinct have already been announced.

Developers have clearly realized there is a demand for lab space and many offerings, particularly those located in areas where zoning permits both office and light industrial uses such as Mount Pleasant in Vancouver, are being proposed. The challenge will be providing the necessary (but expensive) amount of specialized space for these firms at a price point that can be met by the many smaller firms that make up the majority of BC's life sciences sector. This can be achieved through federal and provincial government programs that incentivize the construction of lab space by the private sector and/or the construction of purpose-built facilities such as CSRC that can house these small firms and serve as an incubator until they are ready to go out on their own.

BC has a rich history of success in its life sciences sector and has a vibrant and innovative core of companies that have risen in prominence in recent years but will require the support of all levels of government as well as the development industry to build the economic and physical structures to support the sector for years to come.





Toronto

An evolving life sciences landscape

Toronto is the epicentre of the 'Ontario Life Sciences Corridor,' which is anchored by the downtown MaRS Discovery District, 'Pill Hill' in Mississauga and the McMaster Innovation Park (MIP) in Hamilton. The corridor also extends westward to include the University of Waterloo and its associated life-science and technology cluster. As each city defines and reports on its life sciences sector using different metrics, the most straightforward way to profile the sector is to look at each area separately.

According to a report by Deloitte for the non-profit group Life Science Ontario, the province's life sciences sector generated nearly \$49 billion in revenue in 2017. Province-wide, the sector employs more than 90,000 people and registered 19.3% growth in employment from 2006 to 2017, nearly double the Ontario overall average of 10.5%.

Toronto quick stats

90,000

Ontario's life sciences sector employs more than 90,000 people and registered 19.3% growth in employment from 2006 to 2017

\$1B

Toronto's Discovery District invests more than \$1 billion annually into public and private medical research

35

VC funding deals for life sciences firms in Ontario during 2020

Source: CVCA

2MSF

Hamilton's McMaster Innovation Park is adding more than 2 million square feet of new life sciences space on its campus to meet demand

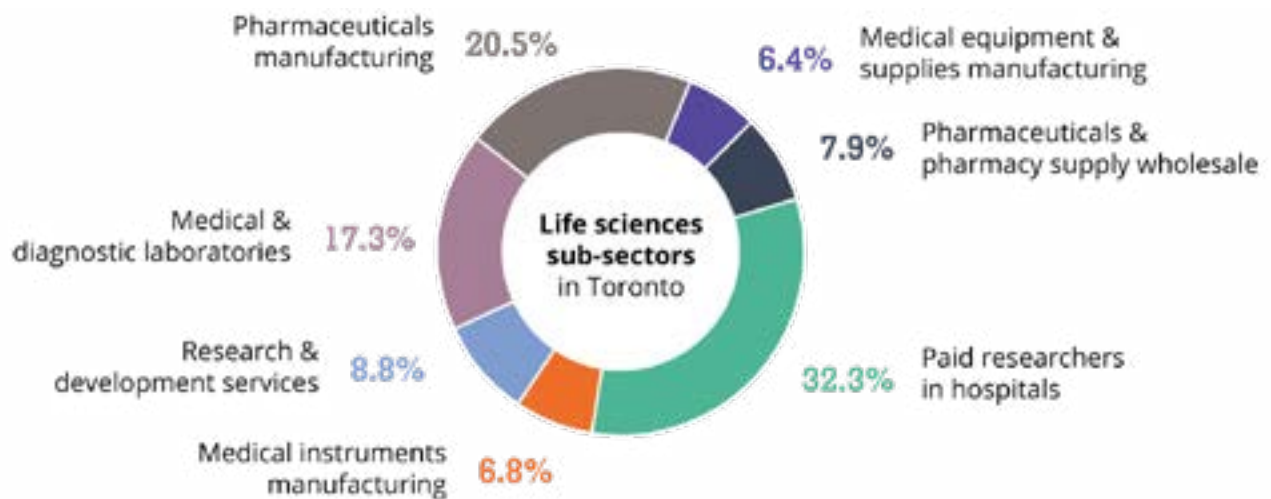
640 million doses/year

Capacity for mRNA vaccine production at Resilience Biotechnologies' expanded Mississauga facility, to be completed in 2024

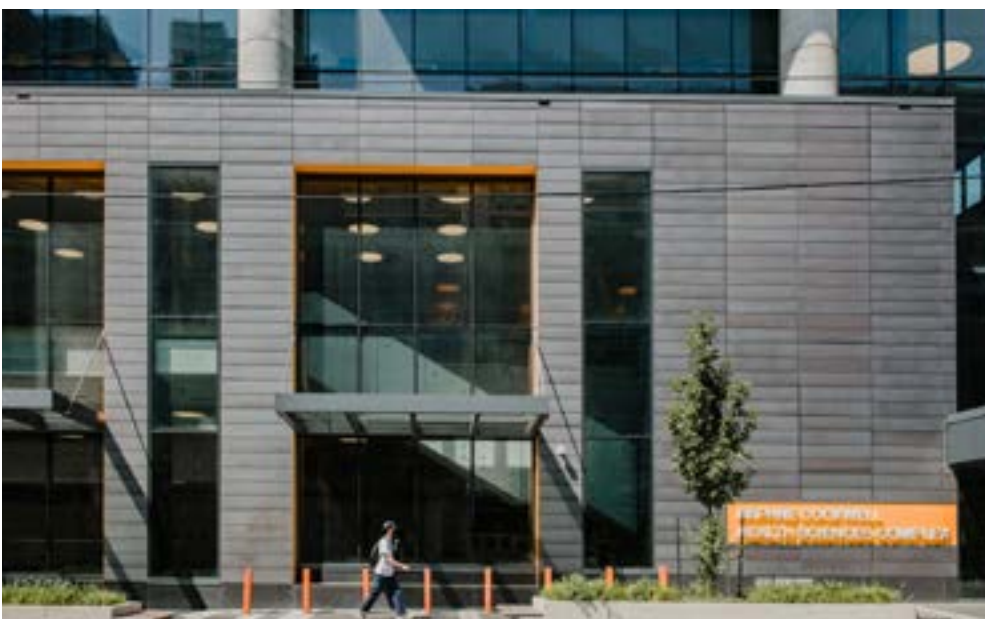
Hubs within the corridor

The City of Toronto's life sciences sector is one of the largest in North America, employing nearly 30,000 professionals and contributing more than \$2 billion to the local economy. Toronto's Discovery District health innovation hub is comprised of 7 million square feet of facilities representing Canada's largest concentration of hospitals, research institutes, business incubators, and

venture capital organizations, along with the University of Toronto. Within a 15-minute walk, 10 different clinical trial sites can be reached. The Discovery District invests more than \$1 billion annually into public and private medical research. The following chart illustrates the city's breakdown of jobs in the sub-sectors that make up life sciences:



Source: City of Toronto



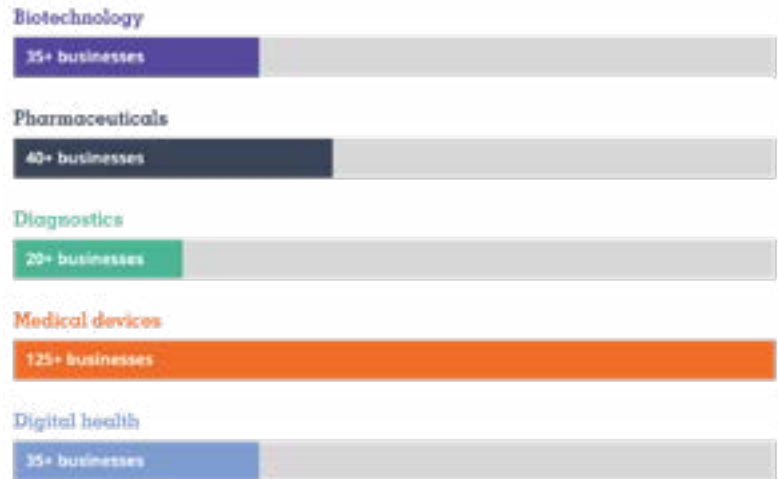
Ryerson University's Daphne Cockwell Health Sciences Complex

Credit: Ryerson University

Situated in the Meadowvale area of Mississauga, 'Pill Hill' is a cluster of most of the city's biotechnology, biomedical and other life-science companies. With more than 470 companies employing approximately 25,000 people, Mississauga's life sciences cluster has evolved from a pharmaceutical hub to a diverse cluster of pharma, biotech, medical devices and other supplier organizations.

Mississauga is a preferred location for larger and more established life sciences companies, ranking as the number one location among major Canadian cities for companies in the sector employing 100 to 499 workers. The following chart illustrates the City's classification of its life sciences sub-sectors and the number of businesses in each:

Mississauga is home to leading life sciences sub-sectors spanning various areas within the industry.



Source: City of Mississauga



McMaster Innovation Park's completely renovated state-of-the-art laboratory building – 44 FRID
 Credit: McMaster Innovation Park, LNG Studio, Chandos Bird HRD (CBH) and other members of the Integrated Project Delivery team.

The McMaster Innovation Park (MIP), in collaboration with McMaster University, acts as a bridge between academia and industry. MIP supports researchers with commercial aspirations and enables students to develop their ideas in its incubator and accelerator programs, while also connecting industry with McMaster University and other academic institutions. MIP primarily works with companies in life sciences, advanced materials and manufacturing, and information & communication technology. The organization is in the process of adding more than 2 million square feet of new life sciences space on its campus to meet demand.

Canada's leading tech ecosystem, Waterloo Region has a track record of innovation looking to the future and is home to thousands of locally grown and global companies. The region is home to many tech firms, including about 75 engaged in health and life sciences, and its start-up accelerator infrastructure encourages further growth. Currently, the University of Waterloo is converting a 90,000-square-foot warehouse into the 'Innovation Arena', to be completed in 2023, which will feature shared product development labs, manufacturing and collaborative office spaces, and will also serve as a health-innovation nexus with increased partnerships and community connections.

Venture capital, funding and investment

According to CVCA, 35 venture capital funding deals for life sciences firms took place in Ontario during 2020. Venture-capital-backed companies in the sector employ nearly 1,500 people in Toronto alone, and more than 100 in Kitchener/Waterloo.

With hubs like the MaRS Discovery District, a concentration of first-class hospitals, and many post-secondary institutions nearby, Toronto has a solid foundation to become a

healthtech research hub. Healthtech has emerged as a leading sector for venture capital investment in the GTA as COVID-19 pushed governments and institutions to embrace health innovation. According to a report from Hockeystick, the GTA tech ecosystem had 186 investments totalling \$1.2 billion during 2020. Healthtech led in overall investment with \$186 million in funding, followed by biotech with \$134 million in funding.

Some notable recent financing deals include:

- In February 2021, Toronto's Antibe Therapeutics raised \$35 million through a bought deal public offering
- Toronto-based digital mental health care provider MindBeacon Holdings raised \$65 million through its December 2020 IPO
- Psychedelic-based products company Cybin, based in Toronto, raised \$45 million and went public through a reverse takeover in October 2020
- Hamilton-based Fusion Pharmaceuticals raised \$290 million in its June 2020 IPO on NASDAQ
- Cyclica, a company using AI for drug development, raised \$23 million in capital in June 2020
- Cloud-based home care software developer AlayaCare, with offices in Montréal and Toronto, received \$48 million in early-stage funding in January 2020
- Deep Genomics, based in the MaRS Discovery District, secured \$40 million in later-stage funding in January 2020

In Mississauga, notable investments in the life sciences sector made during the past year include:

- Bora Pharmaceuticals opened its 183,000-sf North American flagship manufacturing, packaging and analytical services/lab facility.
- Resilience Biotechnologies is set to receive support from the federal government to cover nearly half the cost of a \$400-million, 55,000-sf expansion project at the company's facilities in Mississauga, targeting completion in 2024, which will create 500 permanent jobs as well as 50 co-op placements for students, and allow the company to produce up to 640 million doses of mRNA vaccines per year – further fuelling Canada's bio-manufacturing sector.
- Roche Canada grew its pharmaceutical headquarters in Mississauga with a recent investment of \$500 million to establish a global operation, creating 500 new jobs over the next five years.
- Novo Nordisk and University of Toronto – Mississauga formed a \$40-million partnership to establish the Novo Nordisk Network for Healthy Populations at the University, which will focus on new ways to support healthier urban populations.



In March 2021, Hamilton's biotech and health sciences accelerators received a \$6-million funding boost from FedDev Ontario to support local innovation. The funding will be provided to two non-profits: Innovation Factory and the Synapse Life Science Consortium.

Together, these organizations are launching the Southern Ontario Pharmaceutical and Health Innovation

Ecosystem (SOPHIE). This program will support collaborative projects for Ontario-based life sciences firms, giving them access to Hamilton's unique life sciences capabilities and research expertise.



Key players in the sector

Large and notable life sciences firms with a presence in the various GTA markets include:

- Abbott
- Amgen
- Apotex
- AstraZeneca
- Baxter
- Bayer
- GlaxoSmithKline
- Janssen
- Johnson & Johnson
- LifeLabs
- Merck
- Novo Nordisk
- Pfizer
- Roche
- Sanofi

Impact on commercial real estate market

The need for large facilities meeting rigorous technical requirements has traditionally meant that big tenants in the life sciences sector gravitate toward suburban markets, where more development land has been available and rental rates are lower. More recently, the growth in technology start-ups has meant that a greater share of activity takes place downtown. In the office market, higher availability and vacancy rates prevail in the suburbs compared with downtown, but their year-over-year increases as a result of the pandemic have been less severe. For example, the Meadowvale office node (which corresponds to "Pill Hill") posted 13.6% availability in the first quarter of 2021 – well below the suburban and GTA-wide rates of 16.9% and 14.2%, respectively.

In addition to their substantial suburban presence, some firms have recently turned their focus to establishing a footprint in downtown Toronto. For example, AstraZeneca leased 6,200 sf in the Financial Core's Scotia Plaza office tower, augmenting its much larger Canadian head office and production facility in Mississauga.

Life sciences deals make up a relatively small percentage of overall office and industrial leasing activity but have nevertheless accounted for nearly 6 msf in transactions during the past two decades. Ongoing growth in the GTA's life sciences sector (especially among healthtech start-ups) in the wake of the COVID-19 pandemic (and in preparation for future pandemics) means that demand for office, industrial and lab space will only increase – the latter two types are in short supply across the market.

The expense and complexity of constructing lab space is a deterrent for many developers and little speculative construction takes place. However, the higher rental rates that can be achieved for these facilities will likely encourage some developers to build, amortizing their construction costs over a longer period. With the pandemic and an aging population making life sciences, biotech and pharmaceuticals top of mind, developers are already looking to target this sector more directly as demand grows, with projects aimed at meeting the technical requirements of life sciences tenants. In the meantime, the scarcity of available third-party lab space for lease is forcing some would-be tenants to consider converting traditional office or warehouse space into lab space.



The University of Toronto's Schwartz/Reisman Innovation Centre
Credit: Weiss/Manfredi

Recently, some notable projects have resulted from government, institutional and philanthropic investment, including:

- A new Sanofi S.A. facility to be built on the company's 54-acre site in North York with assistance from the federal, Ontario and City of Toronto governments. The funding will help Sanofi build a new facility that will expand its influenza vaccine production capacity, while giving it the tools to fill-and-finish other vaccines on a mass scale. The project is expected to be completed in 2027.
- Ryerson University's Daphne Cockwell Health Sciences Complex building, completed in 2019, is a 300,000-sf building designed to allow nursing students and other health care professionals to collaborate on projects and lab work. The first eight storeys in the complex bring together four Ryerson academic departments – nursing, midwifery, nutrition and occupational and public health. The eight-storey base also includes research facilities, administration offices and a digital fabrication lab. Above is an 18-storey residence for 330 students.
- Currently under construction at the north end of the city's "Hospital Row" – and part of both the MaRS Discovery District and the University of Toronto – is the university's Schwartz Reisman Innovation Centre, a two-tower complex totaling 750,000 sf of space that will be completed in two phases. The first phase will erect the 12-storey west tower, creating 250,000 sf that will focus on AI and innovation, and provide a new home for the Schwartz Reisman Institute for Technology and Society and the Vector Institute, as well as other leaders of innovation. The second phase will build the larger, 20-storey west tower, which will provide 500,000 sf of space for life-saving biomedical innovation. The project was initiated by a \$100-million donation from philanthropists and business leaders Gerald Schwartz and Heather Reisman.

The current health crisis has served as a wake-up call to strengthen the life sciences and health care industries domestically, and the Toronto-centred Ontario Life Sciences

Corridor has all the elements to facilitate growth in these sectors. Ongoing investment and the explosion of new start-ups in healthtech and AI bode well for the future.



Montréal

A thriving life sciences environment

The Greater Montréal Area (GMA) is ranked the 6th largest life sciences and health tech hub in North America. According to Montréal International, the Québec life sciences and health tech sector boasts 56,000+ industry jobs, 650 companies, 50,000+ university students and 16,000+ university graduates in life sciences and STEM-related programs (80% in GMA).

The scientific excellence of Montréal institutions is recognized around the world with major investments having been made in the sector over recent years to help consolidate Montréal's position as a world-leader in life sciences. Such investments include the development of world-class scientific excellence centres and infrastructures (Technoparc Montréal, Cité de la Biotech, adMare BioInnovations, as well as cutting-edge life sciences and health infrastructures (Centre hospitalier de l'Université de Montréal (CHUM), McGill University Health Centre (MUHC) and CHU Sainte-Justine, mother and child university hospital centre).

With access to financing, an entrepreneurial mindset and a recent boom in the sector, life sciences are one of Québec's most active and innovative industries, further propelled by a global increase in demand resulting from the COVID-19 pandemic in the last few quarters. Montréal's life sciences and health tech sector has developed an increasingly strong concentration of niche industries, such as artificial intelligence and biopharmaceuticals, as the GMA brings together a critical mass of specialized companies and

research institutes, as well as government and funding organizations, who all work in a collaborative environment to foster the development of treatments and technologies.

An industry benefiting from significant support from the Québec government

The Québec government is making the sector's growth a priority, supported by initiatives like the 2017-2027 Québec Life Sciences Strategy. With an initial framework of \$205 million over five years, the Québec Life Sciences Strategy focuses on four key objectives: to increase investment in research and innovation in all life sciences, to foster the creation of innovative companies and ensure their growth, to attract new private investment, and to further integrate innovation into health and social services network.

To achieve these objectives, the strategy requires the international positioning of Québec in two niche sectors: precision medicine and big data in the health sector. The end goal is to attract \$4 billion in private investment to Québec by 2022, while making the province one of the top five North American life sciences hubs by 2027 as the COVID-19 pandemic set the stage for sustained activity in the sector over the next few years, adjusting as needs grow and demand increases.

Venture capital and investment

The GMA has been the target of strong venture capital funding from various players over the past several years. According to the Canadian Venture Capital & Private Equity Association (CVCA), there has been more than US\$2.7 billion in venture capital investments in Montréal between 2018 and 2020. In addition, six of the 10 most active venture capital firms in Canada in 2020 are based in Montréal.

Benefiting from a highly qualified workforce, world-class universities, research centres, commercialization companies, incubators and cutting-edge firms, the life sciences sector is known for its exceptional development potential, propelled by a growing demand fuelled by the pandemic as well as the aging population and unmet medical needs at local, national, and global scales.

According to the latest market overview report of the Québec venture capital and private equity market published by Réseau Capital and CVCA, more than \$1 billion of venture capital was invested in Québec in 2020, of which life sciences represented 33% (\$329 million in 30 deals). Montréal InVivo also reports that Québec has attracted more than 40% of venture capital investments in the life sciences and health tech sector in Canada in the past two years.

Some notable recent financing deals include:

- AlayaCare raised US\$185 million in June 2021 as well as US\$37 million in January 2020
- Ventus Therapeutics raised US\$100 million in April 2021 and US\$60 million in May 2020
- Milestone Pharmaceuticals raised US\$82.5 million in October 2018
- Dialogue raised US\$30 million in July 2020 (Dialogue went public on March 31, 2021, raising \$100 million and resulting in a market value over \$1 billion)



Montréal quick stats

56,000+

Québec's life sciences and health tech sector employs more than 56,000 workers and researchers

80%

The GMA accounts for 80% of Québec's ecosystem in the life sciences and health tech sector

\$329M

VC investments in Québec's life sciences sector during 2020

3 zones

Downtown Montréal, the West Island and Laval boast the GMA's highest concentration of companies in the life sciences and health technology sector

\$4B

The Québec government's target for private investment in the life sciences sector by 2022 as part of its 2017-2027 Québec Life Sciences Strategy



Cité de la Biotech's second phase in Laval, Québec
Credit: Ville de Laval

Key players in the sector

In addition to Montréal-based firms in the life sciences and health tech sector, many foreign companies have chosen the GMA to expand their operations, wishing to become part of a research network that stands at the cutting edge of advances in the industry, fuelled by innovation and collaboration. The city provides life sciences firms with complementary strengths in niche sectors including artificial intelligence, biopharmaceuticals, diagnostics, medical devices, and health tech, fostering business and research collaboration.

Montréal also boasts several governmental and research institutes that interact with biotechnology and drug development companies while ensuring a growing collaboration between academic institutions and companies in life sciences.

Montréal's attractiveness resides in six distinctive elements: a high concentration and a strong synergy between world-class industry leaders; a strategic and complementary position with the largest life sciences centres on the Canadian east coast; a large and highly qualified workforce; low operating costs (among the lowest in the 20 largest cities in Canada and the United States) and strong government incentives, including a 29% tax credit for scientific research and experimental development; as well as a high number of world-class universities producing new generations of doctors, researchers, high-level engineers and technical support staff.

Leading companies with a presence in the GMA include 3M, Bristol-Myers Squibb, Charles River, GlaxoSmithKline, Medtronic, Merck Canada, Novartis, Pfizer, Philips, Roche, Sanofi, Siemens Healthineers, Zimmer, Biomérieux, Grifols, Jubilant, Servier, Nexelis and Teva Corporation, to name a few.

Montréal is the place to be for foreign companies invested in innovation and collaboration:



Map of Greater Montréal's LSHT ecosystem
Credit: Montréal International

Impact on commercial real estate market

While firms in the life sciences and health tech sector are spread out across the entire GMA, there are three specific sub-sectors that boast a high concentration of companies. Downtown Montréal is home to the regional offices of several large biotech and pharmaceutical companies. In total, more than 60 companies have a presence in the centre of the city.

Novartis Pharmaceuticals Canada, based in Dorval, signed a 10-year lease to be relocated to Place Gare Viger. Currently under construction, the building will be seven storeys and 145,000 square feet and ready in 2022. Novartis will this way be closer to the CHUM and Montréal's booming artificial intelligence ecosystem including Mila, the Québec Artificial Intelligence Institute.

The West Island of Montréal is home to the highest concentration of life sciences and health tech firms in the GMA, mainly thanks to the presence of Technoparc Montréal, a centre of excellence in aerospace, technological research, IT, life sciences, clean technologies and nanotechnologies that is home to world-class life sciences and biotech corporations. Technoparc aims to foster the emergence of multi-sectoral innovation clusters that are favourable to the development of many sectors, including life sciences and health tech.

While the West Island market has shown historically high availability rates, consistently hovering above 20%, availability in Technoparc has been steadily decreasing over the past four years, dropping from 23.5% at the first

quarter of 2017 to 15.7% at the end of the first quarter of 2021, fuelled by the increasing demand for quality laboratory and R&D space and the synergy of the sector. New development activity has also picked up recently with the expansion of the adMare BioInnovations Centre (formerly known as NÉOMED) and the construction of a brand-new 640,000-square-foot facility at 2700 Marie-Curie Avenue to meet the increasing demand for top-tier lab space.

North of the Island of Montréal, Laval is also home to several life sciences and health tech firms, most of which are located in Cité de la Biotech, a biotechnology and life sciences hub that is home to world-renowned firms in the health sciences sector. According to the City of Laval, 110 companies and 5,500 jobs are supported within Cité de la Biotech. Created by a partnership between the City of Laval and the INRS (Institut national de la recherche scientifique), the centre aims to ensure the attraction, development, and growth of health science research and to provide a successful work environment for research, training, and commercial development. As the pandemic has increased an already high demand for development space in the local biotechnology sector, Laval and the INRS announced the launch of the second phase of Cité de la Biotech in April 2021, which will provide up to 1.2 million square feet of additional life and health sciences development over the next several years, while creating more than \$1 billion in investment activity and some 7,500 jobs.



Technoparc Montréal
Credit: Technoparc Montréal

Let's talk

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