

Greater Montréal: AI for Health Hub



The world's best economic promotion agency at your service



Montreal





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Top reasons to invest in AI for health in Greater Montréal



A world-leading Al hub

- Top 3 Best Places to Invest in Al in North America
- Google, Microsoft, Facebook, Novartis, and many more major companies developed AI research labs in Montréal
- Cutting-edge expertise developed by researchers such as Yoshua Bengio, Joëlle Pineau, Doina Precup, Hugo Larochelle and Irina Rish



A highly qualified workforce

- Canada's University Capital
- 600+ researchers MSc, PhD, post-doc and applied AI students at Mila, the world's largest academic research lab in deep learning and machine learning
- 19,500 workers with AI skills
- 46,000+ jobs in life sciences and health tech in private companies
- Several thousand researchers in public organizations



Many opportunities for funding & collaboration

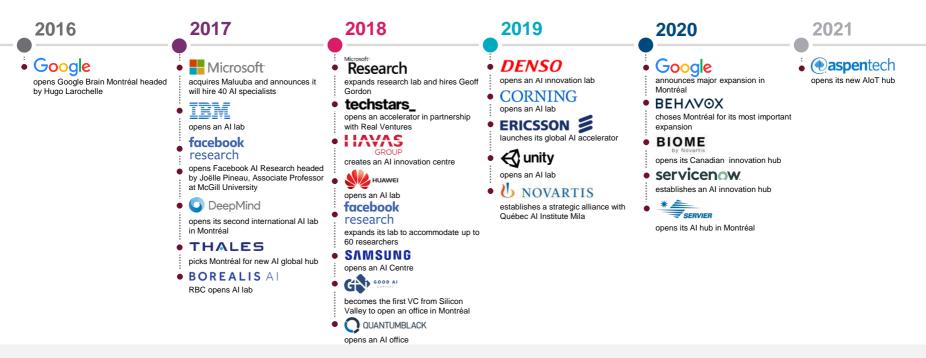
- More than \$3 billion in Al investments announced in Greater Montréal since 2016
- World leaders, including Google, Microsoft and Facebook, opened Al research labs in Montréal in the last few years
- Numerous possibilities for collaboration between researchers and the industry with Scale Al, Prompt, and others



An ethical Al framework

- At the forefront of Al for good initiatives with Montréal Declaration for responsible Al development
- Home of the International Centre of Expertise for the Advancement of Artificial Intelligence (ICEMAI) and the International Observatory on the Societal Impacts of AI and Digital Technology (OBVIA) fostering responsible AI

A few of the world leaders developing their AI expertise in Montréal



Other foreign companies that have chosen Greater Montréal



BI0S

axionable BUSPATROL

(I)samasource







BOAST.AI

01 Life Sciences: A Strategic Sector for Québec





Québec's ambitious Life Sciences Strategy

Two priority niches to position Québec internationally

1 Precision medicine

2 Big Data in the health sector

Four key objectives

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

Two goals

- Attract **\$4 billion** of private investment in Québec by 2022
- 2 Make Québec one of the **Top 5** North American life sciences clusters by 2027

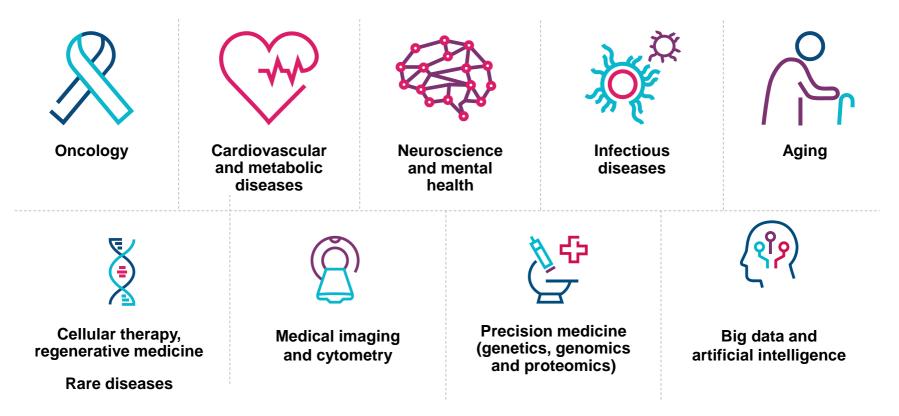


02 A Unique Interconnected & Collaborative Ecosystem

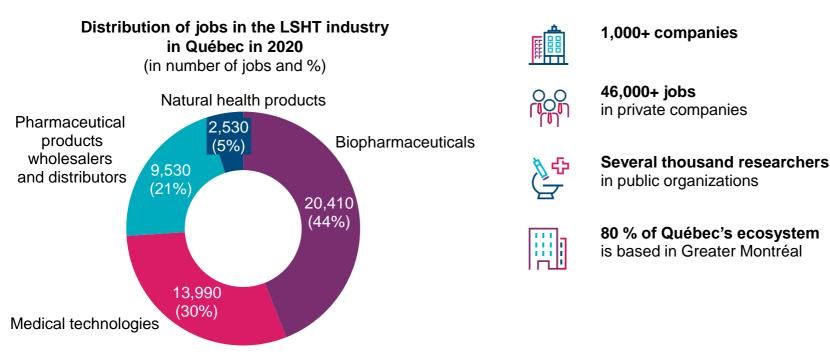




Montréal has developed an internationally acclaimed expertise in several fields



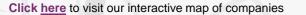
Québec's life sciences and health tech ecosystem is among the largest in North America



Source: Ministère de l'Économie et de l'Innovation, "Secteur des sciences de la vie et technologies de la santé, Recensement des entreprises 2020; Statistics Canada, Special compilation based on the Labour Force Survey, 2020; Montréal International's analysis.

Major hub to boost business partnerships throughout the region









BIOTECH

CITY

CQIB



Trudeau International Airport



Legend

- Industrial Park / innovation cluster
- University Hospital Centre
- University

Numerous foreign companies have chosen Greater Montréal to expand their operations



World-renowned scientific excellence centres and infrastructures

Research centres Montréal is reputed for its collaborative approach (Research – Industry – Government) *neuro Centre universitaire _____ McGill University de santé McGill Health Centre **CHUM** Recent major investments in cutting-edge infrastructures: MONTREAL Douglas HEART Université 💾 INRS ugm NIVERSITÉ DE RECHERC **CHU Sainte-Justine**, g **McGill University** Centre hospitalier Mother & child **Health Centre Genome**Ouébec de l'Université de **university Hospital** (MUHC) Montréal (CHUM) Centre Hôpital général juif NAC · CNAC Jewish General Hospital 500.000 220,000 80,000 ambulatory ambulatory ambulatory Centre de recherche Hôpital Maisonneuve-Rosemont entre affilié à l'Université de Montréal visits/year visits/year visits/year

NUTITUTE FOR RESEARCH IMMUNOLOGY AND CANCEL

de Montréa

HSCM FHSCM

Doués pour la vie

СНЦ

Sainte-Justine

Examples of flagship programs to accelerate discovery, development and commercialization

Pharma/biotechs



adMare BioInnovations: Life Sciences & Health Technology Innovation Hub including the Néomed Innovation Centre, hosting subcontractor research organizations, biotech companies and consultants



IRICOR: Accelerating discovery and commercialization of highly innovative therapies in oncology by strong partnerships with industry

Health Tech



Transmedtech Institute: Transdisciplinary and intersectoral open innovation ecosystem or living lab – To develop next generation medical technologies



CENTECH: The ÉTS business incubator and accelerator, ranked among the 20 top performing university incubators in the world. One of two key sector is medical device



DISTRICT 3: Startup accelerator and entrepreneurial community located within Concordia University



MEDTEQ: Consortium for industrial research and innovation in medical technology

CTS

Health Tech Campus/Campus des technologies de la santé (CTS): Accelerator for medical technology companies



CQDM: Development of breakthrough tools and technologies that enhance biopharmaceutical R&D productivity



C3i: One-stop shop for the development, translation and commercialization of ground-breaking cancer immunotherapies treatments



CATALIS: Office mobilizing all stakeholders involved in early clinical research in Quebec

Top AI accelerators and incubators to help develop tomorrow's breakthroughs in life sciences

techstars_ Montreal Al Accelerator

This program focuses on advancing the development and application of AI across industries and markets



Recognized as one the world's top incubator programs by UBI Global's Top 20 University Business Incubators for 2019–20. The program for AI startups is run in partnership with Thales



A partnership with HEC Montréal, this program focuses on AI and data science to capitalize on Montréal's expertise in the sector

FounderFuel

This program provides structured and unstructured mentoring and coaching by proven entrepreneurs over a four-month residency program for two cohorts of 8 to 10 companies per year



This program is for early or idea stage Alenabled startups TANDEMLAUNCH

This program specializes in the consumer electronics technology market, with a special interest in companies leveraging AI



Recognized as one the world's top incubator programs by UBI Global's Top 20 University Business Incubators for 2019–20. It offers programs for startups at every juncture of their growth



Program for digital health created by Centre québécois d'innovation en biotechnologie (CQIB) and Campus des technologies de la santé (CTS)

Strong venture capital funding from various players in Québec

- More than US\$2.7 billion in VC investments between 2018 and 2020 in Montréal
- 6 of the 10 most active VCs in Canada in 2020 are based in Montréal
- Example of funding for life sciences companies:





Mila, a thriving AI hub in the Mile-Ex neighbourhood

- With 600+ researchers, Mila is the world's largest academic research lab specialized in deep learning and reinforcement learning
- A collaborative ecosystem of AI researchers, startups and major companies
- Examples of global strategic partners within Mila:





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The Mila network: access to high-level AI partners



Creating digital solutions to optimize health care delivery, reduce costs and improve health outcomes

♡ Dialogue

Design of an evolving AI-based questionand-answer telemedicine platform to establish a preliminary diagnosis and collect all relevant results



Development of AI tools to accelerate understanding of the behavior of molecules when confronted with a virus or bacteria for the creation of new vaccines and drugs



Using AI to understand the biological mechanisms of disease, the design of molecules, or the prediction of clinical responses and safety profiles to facilitate clinical testing



Take advantage of deep learning for drug design and make these technologies more widely available to R&D organizations

ImmunoPrecise

Valorization of the unexplored data generated in order to transform the way therapies are developed

U NOVARTIS

Opening of Novartis Biome Canada, an innovation centre that uses the AI ecosystem to accelerate the use of health technologies



Leveraging machine learning and advanced computational methods to accelerate drug discovery and development

A unique centre of excellence: IVADO (Institute for Data Valorisation)



Close to 150 Over 270 More than **1,400** scientists members and partners collaborative (professors, professionals and research projects students) with complementary areas of expertise Research DATA SCIENCE FOR REAL-TIME DECISION-MAKING techlab 📿 CIRRELT Mila GERAD centres propulsion _{Québec} agtech **Network** AERDY CARGO partners MONTREA Academic CIRANO Allier savoir et décision research chairs partners & labs International .AAS The 🕂 Atlanstic partners **Alan Turing** 2 • 0 • 2 • 0 Institute

Source: IVADO, Rapport mi-mandat, 2021.

YOSHUA BENGIO

One of the founders of the deep learning movement and winner of the prestigious Turing Award 2018

Founder and Scientific Director of Mila



JOËLLE PINEAU

Co-director of the Reasoning and Learning lab at McGill University

Head of the Facebook Al Research lab in Montréal

facebook research

IRINA RISH

Associate Professor at the Université de Montréal and world renown Al scientist

Holder of a new \$35M Canada Excellence Research Chair and core member of Mila



The International Centre of Expertise for the Advancement of Artificial Intelligence (ICEMAI) launched in Montréal

- Spearheaded by Montréal International as part of the Global Partnership on Artificial Intelligence (GPAI)
- It is one of the two centres of expertise along with the centre in Paris who will work closely with the GPAI Secretariat, housed at the OECD
- ICEMAI will support two of the four themes the GPAI will be working on: responsible use of AI and data governance
- It will also analyze measures to strengthen our national capacity to commercialize and adopt Alrelated technologies



- \$15M investment by the Government of Québec and the Government of Canada
- A collaboration of industry, the scientific community and civil society:





In addition to local and international experts

Forum

IA Ouébec

Digital Health and Discovery Platform (DHDP), a Canadian initiative to accelerate precision medicine through Big data and AI

Digital Health & Discovery Platform

- \$49M Federal Government Awards to Terry Fox Research Institute and Montréal's Imagia led Consortium to Accelerate Medical Breakthroughs
- The joint project aims to unlock data-driven discoveries in cancer and other diseases to unleash the full potential of personalized healthcare
- This award, together with \$108M in cash and \$165M in in-kind contributions from consortium partners, supports the DHDP that will combine Canadian expertise in AI and precision medicine

 97-members across 9 provinces: 31 healthcare institutions, 9 SMEs and 10 large enterprises, 7 universities, 22 research foundations, granting agencies and NGOs, and all 4 major Canadian AI research labs from Québec, Alberta and Ontario including:



Examples of Montréal-based companies using AI in healthcare



IMAGIA: developing radiomics biomarkers and clinical decision support systems

MIM

My Intelligent Machines: accelerating post genomic research by leveraging AI & bioinformatics



QUANTUMBLACK: using data, analytics, and design to optimize how drugs are brought to market



InVivo AI: facilitating accurate toxicity screening in the earliest phases of drug discovery



Corstem: medical imaging analysis and computer vision, using machine learning



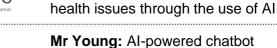
Informed experiments: distilling the complexity of gene interaction networks with Al algorithms to accelerate cancer research

PRECISION ANALYTICS

Precision analytics: predictive analytics and cloud computing to handle large datasets

I*L***GNOS**

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Mr Young: Al-powered chatbot designed to help cope with anxiety

Diagnos: early detection of critical



Myelin: Al synthesis of ASD scientific data

InnoVie Health



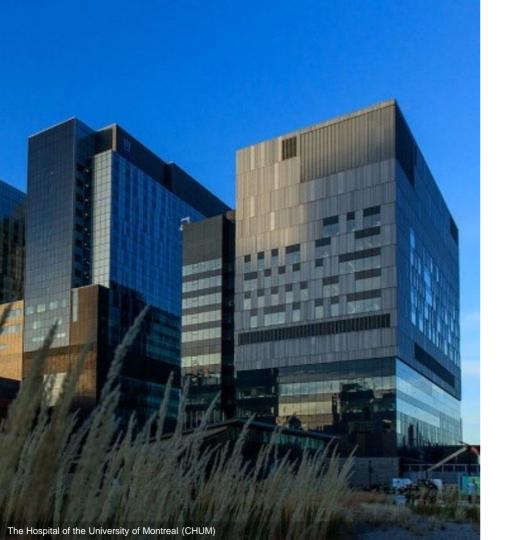
Innovie Health. Al solution to drive the most accurate care management strategy for healthcare system

AFX Medical: Al-powered radiology tools intended to treat brain disease



BIOS: developing neural interfaces to enable AI-based treatments on organs and nerve systems throughout the body

Zilia: combines imaging, spectrometry and AI for the detection of biomarkers involved in ocular, neurological and systemic conditions



Key initiatives at CHUM to facilitate data access and the use of AI

Data lake project CITADEL

- The Center for the Integration and Analysis of Medical Data (CITADEL) of the Centre hospitalier de l'Université de Montréal (CHUM) is one of the initiatives adopted to facilitate learning, teaching and communication:
 - 20 integrated information systems
 - 19.4 million episodes of care
 - 3.6 million patient data

School of AI in Healthcare (SAIH)

- Devoted to the study of the social, legal and ethical implications of Al in the health sector
- Doctors and researchers at the CHUM are pursuing 80 projects involving artificial intelligence

Montréal is home to Canada's Al cluster headquarters



SCALE AI

Canada's AI supply chain supercluster



Québec's Al organization fostering the development of Québec's Al ecosystem



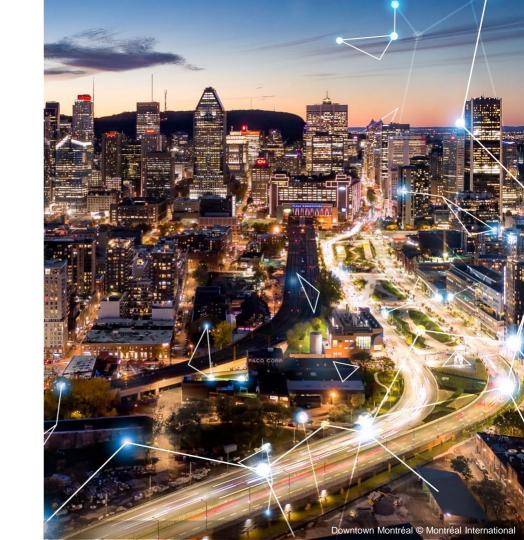
Other health-related Canadian superclusters



a cross-industry collaboration in healthcare, communications, technology



The Innovative Manufacturing supercluster: manufacturing 4.0



At the forefront of AI for good initiatives

For ethical & responsible Al



< > Si Montréal Declaration m Responsible AI_ fro </ >

Since December 2018 more than 1,900 signatures from citizens and 108 organizations

An initiative of the Université de Montréal

Research centres with AI for good initiatives



Fostering a dialogue on the socially responsible use of AI and the development of social and environmental applications. Montréal's AI4Good lab aims to get more women working in Artificial Intelligence and other events

HumanIA

Directing AI towards the common good through humanistic and multidisciplinary studies and research



Catalyst for technosocial and responsible innovation projects



TechAide AI4Good Conference and Hackathon 2020

SINCE ITS OFFICIAL LAUNCH IN 2016, TECHAIDE HAS RAISED \$1.34M FOR CENTRAIDE

03 A Deep and Growing Pool of Highly Qualified Talent





The best student city in the Americas and Canada's university capital

- Canada's university capital: 11 university institutions and 60 colleges
- 320,000 post-secondary students, including more than 200,000 university students and 35,500 international university students
- 1st in Canada for university research funding with \$1.34+ billion yearly



Best student city in the Americas tied with Boston QS Best Student Cities Rankings 2022



28 Source: QS Best Student Cities in the World, 2022; Ministry of Education and Higher Education, 2021; Research Infosource Inc., 2020.



A pool of highly qualified workers

Life sciences and STEM-related occupations in Greater Montréal	Employees in 2019
Life sciences professionals (including chemists, chemical engineers and biologists, etc.)	12,800
Other engineers (including Industrial, manufacturing and computer engineers	15,900
Computer and information systems professionals	96,700
Mathematicians and statisticians	3,200
Total	134,500



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A new generation ready to take over

More than 14,000 university students are enrolled in artificial intelligence and data-related programs in Greater Montréal:

Al-related University programs	Students enrolled 2019-2020	University graduates 2019
Computer Sciences	10,181	2,061
Computer Engineering and Computer Science	2,328	464
Mathematics	1,416	313
Applied Mathematics	168	33
Probabilities and Statistics	203	51
Total	14,296	2,921

Source: Ministère de l'Éducation et de l'Enseignement supérieur, 2021; compilation Montréal International.

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A labor pool of AI and tech-related specialists

Al-related jobs	Employees in 2020		
Information Systems Analysts and Consultants	46,500		
Computer Programmers	40,300		
Computer and Information Systems Managers	8,000		
Computer Engineers	6,500		
Software Engineers and Designers	4,400		
Database Analysts and Data Administrators	9,900		
Mathematicians	3,300		
Total	118,900		

118,900 Al and Tech-Related specialists employed in Greater Montréal

Montréal's workforce of + 2 million is among North America's most dynamic and offers a high degree of stability with turnover rates well below North American averages. The turnover rate for the IT industry is 11%

Source: National Occupation Classification (NOC) 2020, Statistics Canada 2018; Diagnostic sectoriel 2018, Technocompétences.

^{*} Overall workforce risk includes relocation and expatriation; mergers, acquisitions and partnerships; absenteeism; employee health and well-being programs; internal relationships; employment in general; globalization; cultural differences; and talent sources.

There are close to 19,500 workers with AI skills in Montréal, an increase of 22% over the past 12 months

The 40 key skills taken into account to define Al workers*

Number of AI workers who have the skills below

6,133 5,868 5,675

Linux

Data Analysis

Algorithms JavaScript

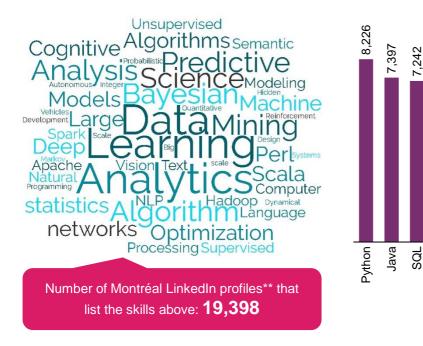
Machine Learning

4,974 4,915

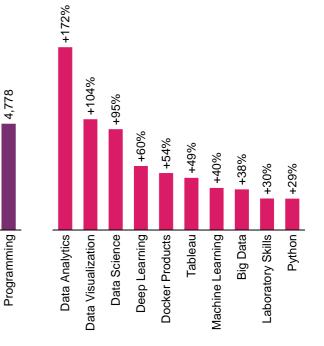
6,993

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Fastest-growing skills among AI workers over the past 12 months



*Key skills identified using LinkedIn's Talent Insights tool are not cumulative or exclusive. **Excluding profiles for the following titles: *founder, co-founder, CEO* and *President*. Source: LinkedIn, Talent Insights, February, 2020.



04 Attractive Operating Costs and Incentives





Competitive operating costs among the 20 largest metro areas in Canada and the U.S.

1 st clinical trials and life sciences R&D centre¹

1st Software development centre

2nd bio-pharma manufacturing²

2nd medical devices manufacturing plant

Source: fDi Benchmark, 2020.

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1: Research, discovery, design, development or testing of biotechnology or pharmaceutical related products and/or medical devices.

2: Companies in this industry develop and manufacture therapeutic products and in vitro diagnostics using biotechnology.



Québec offers corporations an attractive tax treatment

Comparison of effective corporate tax rate (%) Selected Canadian provinces and U.S. States, 2021

Québec (Montréal)	26.50%
Ontario	26.50%
Massachusetts	27.32%
California	27.98%
New Jersey	28.11%
Illinois	28.51%
New York	34.64%



Source: Investissement Québec, 2021.

Advantageous salaries for pharma companies

Median annual salaries* (US\$) for seven typical occupations in pharma

	Montréal	Toronto	Raleigh	Chicago	Boston	Newark	San Francisco
Laboratory Technician	\$43,144	\$45,999	\$47,043	\$52,770	\$57,904	\$55,750	\$62,112
Laboratory Supervisor	\$65,066	\$69,318	\$76,291	\$86,913	\$91,064	\$93,936	\$101,127
Scientific Researcher	\$66,609	\$70,967	\$77,654	\$88,356	\$92,564	\$95,576	\$102,818
Pharmaceutical Detailer	\$67,589	\$71,946	\$87,509	\$91,903	\$101,244	\$99,874	\$108,007
Laboratory Head	\$73,911	\$78,875	\$82,156	\$92,862	\$100,224	\$96,082	\$117,247
Biochemist	\$81,293	\$86,506	\$101,658	\$112,220	\$116,355	\$124,745	\$128,745
R&D Manager (technical)	\$106,358	\$112,837	\$144,945	\$148,619	\$161,382	\$172,031	\$177,461

* Base salaries based on 5 years of experience, for the Pharmaceuticals industry (NAICS 3254). Currency exchange based on the monthly average of May 2021: US\$1.00 = CA\$1.2126. Source: Economic Research Institute Inc., June 2021.

Advantageous salaries for medtech companies

Median annual salaries* (US\$) for ten typical occupations in medtech

	Montréal	Toronto	Raleigh	Dallas	Minneapolis	San Diego	Boston	San Francisco
Quality Assurance Specialist	\$53,226	\$56,865	\$64,008	\$66,835	\$69,898	\$70,235	\$76,867	\$81,966
Clinical Liaison	\$54,887	\$58,662	\$63,651	\$68,292	\$69,685	\$72,026	\$74,789	\$83,097
Project Management Specialist	\$55,615	\$59,646	\$63,363	\$67,690	\$67,293	\$69,523	\$76,853	\$82,299
Regulatory Affairs Specialist	\$62,505	\$66,982	\$73,888	\$78,783	\$77,122	\$80,116	\$88,644	\$94,956
Manufacturing Engineer	\$68,290	\$72,564	\$83,694	\$91,962	\$88,976	\$93,911	\$97,815	\$104,287
Field Service Manager	\$72,362	\$76,404	\$91,794	\$96,812	\$96,483	\$99,235	\$108,584	\$118,101
Mechanical Engineer	\$76,023	\$80,536	\$95,517	\$104,745	\$100,393	\$106,178	\$110,255	\$118,086
Project Leader	\$78,257	\$83,523	\$102,382	\$108,053	\$105,484	\$110,388	\$118,172	\$128,516
Software Developer	\$77,046	\$81,550	\$99,087	\$104,234	\$100,897	\$106,539	\$111,951	\$125,225
Production Manager	\$83,956	\$89,461	\$105,907	\$113,545	\$109,576	\$113,695	\$122,580	\$133,606

* Base salaries based on 5 years of experience, Medical Device Manufacturing (NAICS 3391). Currency exchange based on the monthly average of May 2021: US\$1.00 = CA\$1.2126. Source: Economic Research Institute Inc., June 2021.

Low mandatory benefit costs for employers

Examples of mandatory benefit costs for employers, 2021

Gross annual salary*	\$50,000	\$100,000	\$125,000
Québec Public Pension Plan (employee: 5.9%; employer: 5.9%, max. \$3,427.90)	2 743,50 \$	3 427,90 \$	3 427,90 \$
Québec Parental Insurance Plan (employee: 0.494%, employer: 0.692%, max. sal. of \$83,500)	346,00 \$	577,82 \$	577,82 \$
Employment Insurance (employee: 1.18%, employer: 1.65%, max. sal. of \$56,300)	826,00 \$	930,08 \$	930,08 \$
Health Services Fund (max. 4.26% if global salary total is more than \$6,5M)	2 130,00 \$	4 260,00 \$	5 325,00 \$
Commission des normes du travail (Labour standards board) (0.07%, max. sal. of \$83,500)	35,00 \$	58,45 \$	58,45 \$
Commission de la santé et sécurité du travail (Occupational health and safety board) (0.42% in service sector, max. sal. of \$83,500)**	210,00 \$	350,70 \$	350,70 \$
Workforce Skills Development and Recognition Fund - Québec Training Law 1% (1% of their total payroll in training for employers with total annual payroll over \$2M)	500,00 \$	1 000,00 \$	1 250,00 \$
Total benefit costs	6 790,50 \$	10 604,95 \$	11 919,95 \$
Total cost	56 790,50 \$	110 604,95 \$	136 919,95 \$
Total benefits in % of gross annual salary	13,58 %	10,60 %	9,54 %

Note: *Paid vacation represents a minimum of 4% of salary and is included in gross salary. Some rates apply up to a maximum insurable revenue.

**The rate for the service sector (65110 - Bureau de courtage; bureau de services professionnels; bureau offrant des services de soutien administratif) is 0.42%. The average premium rate in 2021 is \$1.77 per \$100 of payroll. Source: Revenu Québec, 2021.

Various incentives tailored to your project



- Strategic Innovation Fund
- <u>Canada Economic Development</u> for Québec regions
 - Tax credit on SR&ED
- Mitacs Acceleration program for talent
- Support for technology innovation



- ESSOR Fund for Major Projects
- <u>Tax credits for Large Investment Project</u>
- Refundable Tax credit on R&D
- Tax Credit for Investments and Innovations (C3i)
- Deduction for the Commercialization of Innovations (IDCI)
- Financial assistance for job creation and training

Tax holiday for foreign experts and researchers



Sustainable development programs are also available at the municipal level

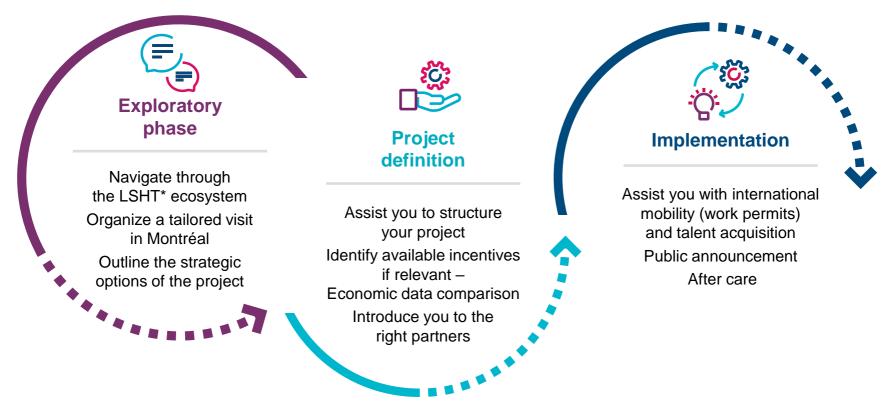
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Montréal International's Personalized, Free and Confidential Services





Your development in Montréal: Montréal International can assist you through the whole process



*LSHT: Life Sciences and Health Technologies



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