

# Greater Montréal: An AI for Health Hub



# The world's best economic promotion agency at your service





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# Top reasons to invest in AI for health in Greater Montréal



## A world-leading AI hub

- **Top 3 best places to invest in AI 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
- **56,000 jobs** in life sciences and health tech
- More than **14,000 university students** enrolled in AI and data-related programs



## Many opportunities for funding & collaboration

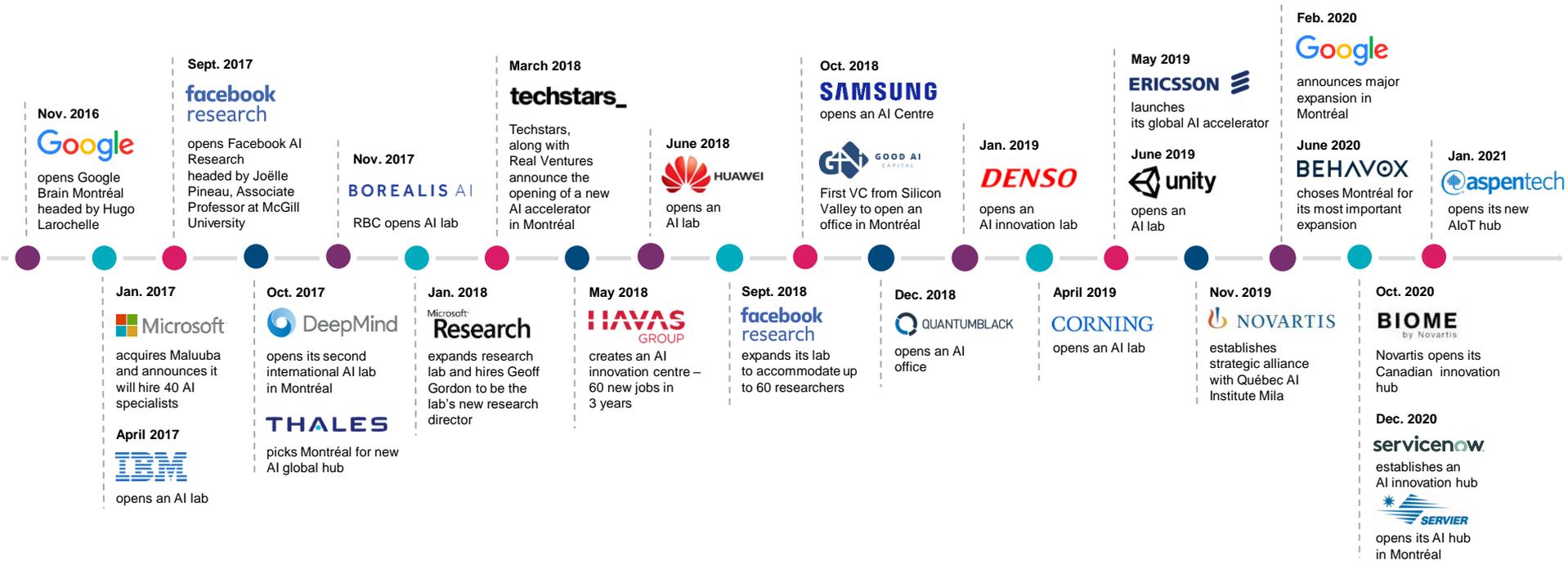
- **More than \$3 billion in AI investments announced in Greater Montréal** since 2016
- World leaders, including **Google, Microsoft** and **Facebook**, opened AI research labs in Montréal in the last few years
- Numerous possibilities for collaboration between researchers and the industry with **Scale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



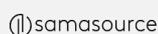
## An ethical AI framework

- At the forefront of AI for good initiatives with **Montréal Declaration for responsible AI 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 flourishing in Greater Montréal



# 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

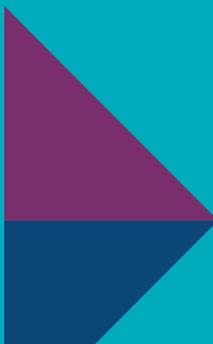
## Two goals

- 1 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



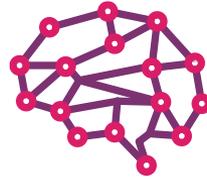
# Montréal has developed an internationally-acclaimed expertise in several fields



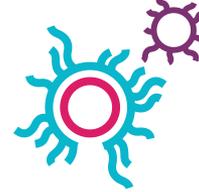
**Oncology**



**Cardio-vascular  
and metabolic  
diseases**



**Neuroscience  
and mental  
health**



**Infectious  
diseases**



**Aging**



**Cellular therapy,  
regenerative medicine**

**Rare diseases**



**Medical imaging  
and cytometry**



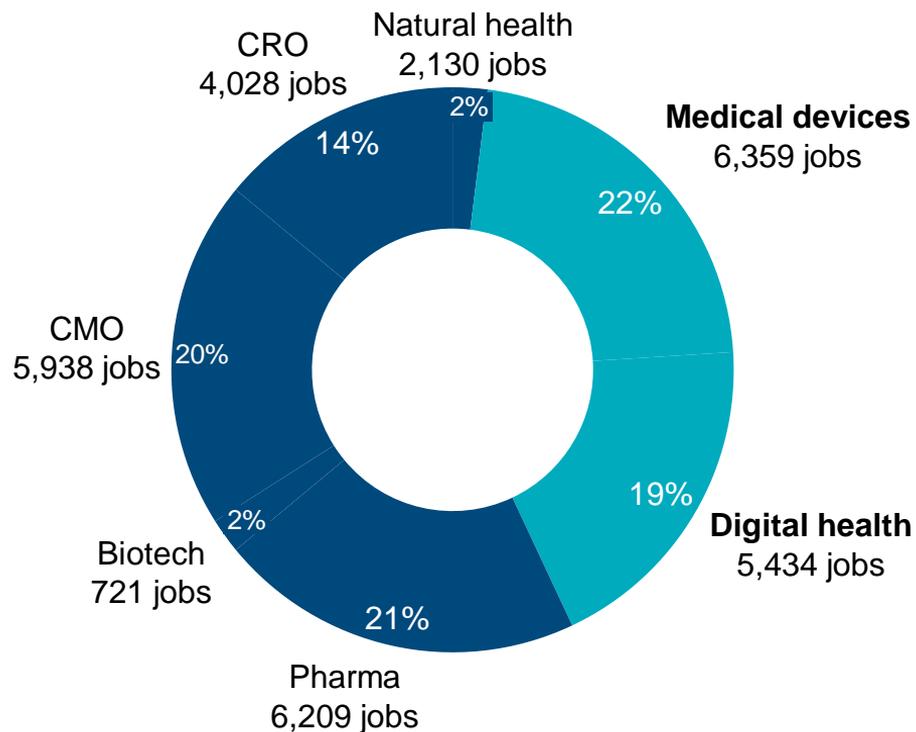
**Precision medicine  
(genetics, genomics  
and proteomics)**



**Big Data and  
artificial intelligence**

# Québec boasts a thriving health tech sector

Distribution of jobs in Québec's life sciences and health tech (%)



## Québec life sciences and health tech sector



**56,000**

Total jobs (80% concentrated in Greater Montréal)

## Québec health tech sector

- **40%+** of all jobs and
- **50%+** of companies

Medical devices	Digital health
151 companies	169 companies
6,400 jobs	5,400 jobs

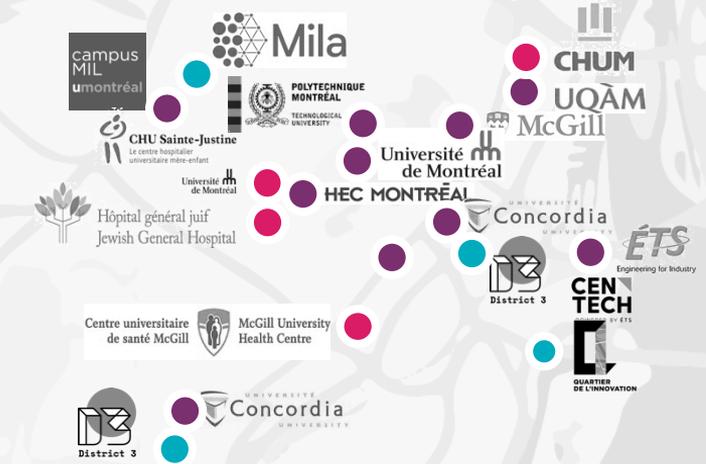
Source: Montréal InVivo, 2017; Ministère de l'Économie, de la Science et de l'innovation, 2017.

# Major hub to boost business partnerships throughout the region

Click [here](#) to visit our interactive map of companies



Trudeau  
International Airport



Innovation centre – fall 2020

**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

Montréal is reputed for its **collaborative approach**  
(Research – Industry – Government)

Recent major investments in **cutting-edge infrastructures**:



**Centre hospitalier  
de l'Université de  
Montréal (CHUM)**

500,000  
ambulatory  
visits/year



**McGill University  
Health Centre  
(MUHC)**

220,000  
ambulatory  
visits/year



**CHU Sainte-Justine,  
Mother & child  
university hospital  
center**

80,000  
ambulatory  
visits/year

Research centres		
		
		 INSTITUTE FOR RESEARCH IN IMMUNOLOGY AND CANCER Université de Montréal
	 Institut universitaire de génétique de Montréal	 Doués pour la vie
	 MONTREAL CLINICAL RESEARCH INSTITUTE AFFILIATED WITH UNIVERSITÉ DE MONTRÉAL	
		 Le centre hospitalier universitaire mère-enfant Université de Montréal
	 Centre de recherche Hôpital Maisonneuve-Rosemont Centre affilié à l'Université de Montréal	

# 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



**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

## 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 sectors is medical device



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



**MEDTEQ:** Consortium for industrial research and innovation in medical technology



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

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



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



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 AI-enabled startups



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 billions in VC investments** between 2018 and 2020 in Montréal
- **Six of Canada's ten most active VCs** in 2020 are based in Greater Montréal
- Example of funding for life sciences companies:

 raised **US\$82.5 M** – September 2019

 raised **US\$80 M** – October 2018

 raised **US\$60 M** – May 2020

 raised **US\$37 M** – January 2020

 raised **US\$30 M** – July 2020

 raised **US\$29 M** – July 2017



# Mila, a thriving AI hub in the Mile-Ex neighborhood

- 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 strategic global partners within Mila:



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



More than **1,400** scientists  
(professors, professionals and  
students) with complementary areas of  
expertise

Close to **150**  
members and partners

Over **270**  
collaborative  
research projects

## Research centres



## Network partners



## Academic partners



## International partners



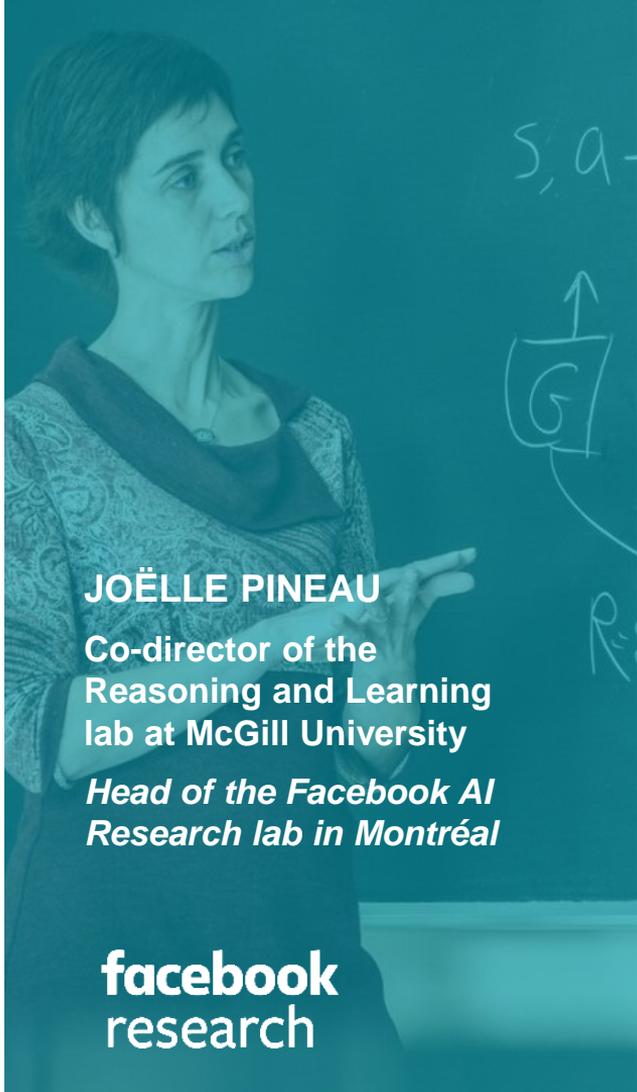
**40+**  
research chairs  
& labs

A portrait of Yoshua Bengio, a man with short, wavy grey hair, smiling warmly. He is wearing a dark sweater over a collared shirt. The background is a soft, out-of-focus indoor setting.

## 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*

A portrait of Joëlle Pineau, a woman with dark hair, looking thoughtfully to her right. She is wearing a patterned top and a dark scarf. The background is a chalkboard with some mathematical diagrams and equations.

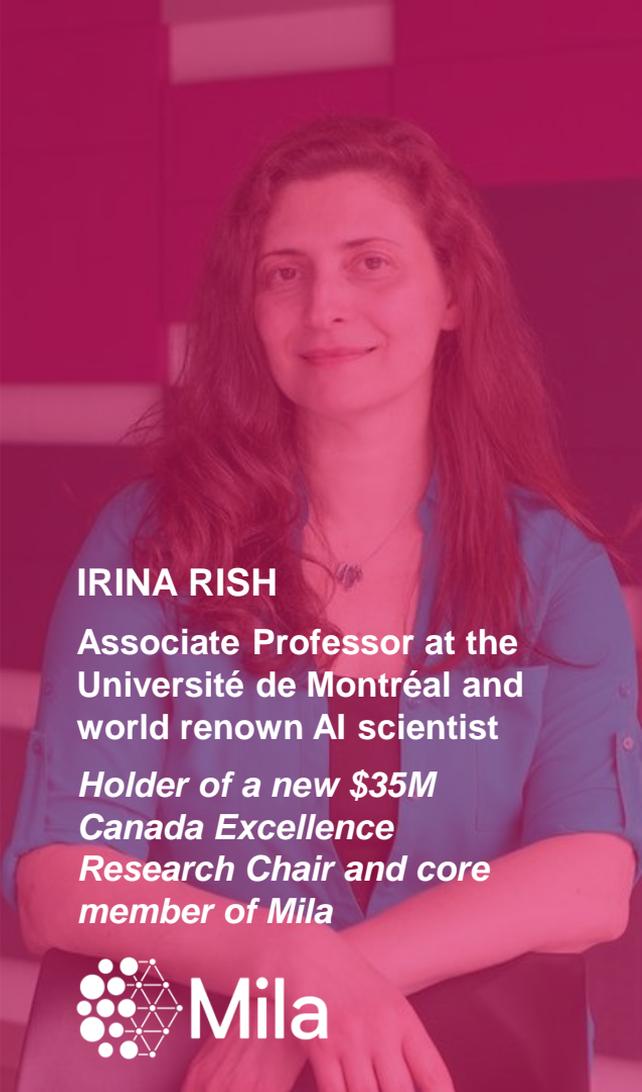
## JOËLLE PINEAU

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

*Head of the Facebook AI Research lab in Montréal*

The Facebook Research logo, with "facebook" in a lowercase, bold, sans-serif font and "research" in a smaller, lowercase, sans-serif font below it.

facebook  
research

A portrait of Irina Rish, a woman with long, wavy brown hair, smiling gently. She is wearing a blue button-down shirt. The background is a blurred indoor setting with warm lighting.

## IRINA RISH

Associate Professor at the Université de Montréal and world renown AI 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 AI-related technologies**



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



Government of  
Canada's  
Advisory Council  
on Artificial  
Intelligence

*In addition to local and international experts*

# 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



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



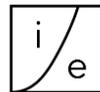
**QUANTUMBLACK:** using data, analytics, and design to optimize how drugs are brought to market



**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 AI algorithms to accelerate cancer research



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



**Diagnos:** early detection of critical health issues through the use of AI



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



**Myelin:** AI synthesis of ASD scientific data



**Innovie Health:** AI solution to drive the most accurate care management strategy for healthcare system



**AFX Medical:** AI-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 **AI in the health sector**
- Doctors and researchers at the CHUM are pursuing **80 projects involving artificial intelligence**

# Montréal is home to Canada's AI cluster headquarters



**SCALE AI**

Canada's AI supply chain supercluster

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**Forum  
IA Québec**

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

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**Other health related  
Canadian superclusters**



**DIGITAL  
TECHNOLOGY  
SUPERCLUSTER**

a cross-industry  
collaboration in healthcare,  
communications, technology



**Next Generation  
Manufacturing Canada**

The Innovative  
Manufacturing supercluster:  
manufacturing 4.0



# At the forefront of AI for good initiatives

- For ethical & responsible AI



<>  
Montréal Declaration  
Responsible AI\_  
</>

An initiative of the Université de Montréal

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

- Research centres with AI for good initiatives



Mila

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

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HumanIA

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

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ELEMENT<sup>AI</sup>

Opened an office dedicated to AI for good



TechAide AI4Good Conference and Hackathon 2020

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

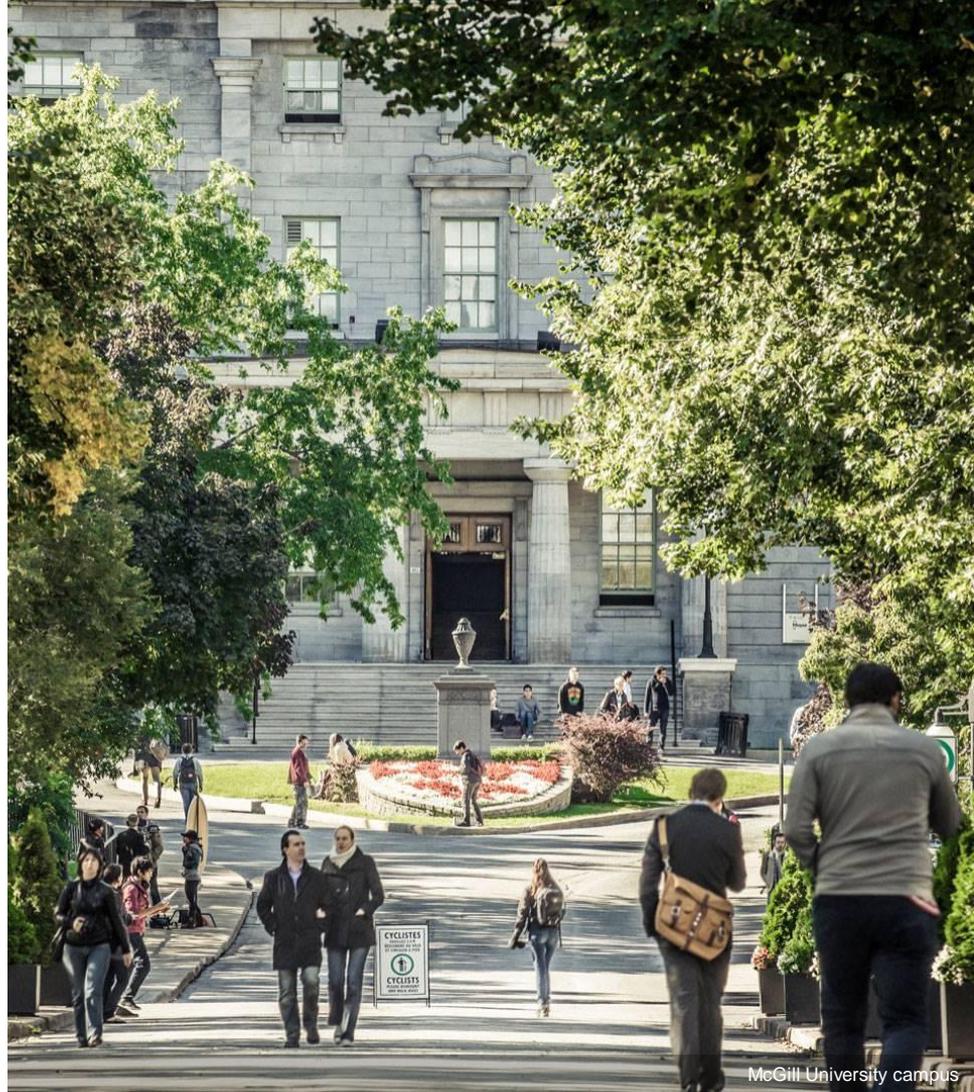
# 03

## 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
- \$1+ billion in funding yearly dedicated to university research
-  Best student city in the Americas  
2019 QS Best Student Cities Rankings



# 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
<b>Total</b>	<b>134,500</b>



# 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:

AI-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
<b>Total</b>	<b>14,296</b>	<b>2,921</b>



# A labor pool of AI and tech-related specialists

AI-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
<b>Total</b>	<b>118,900</b>

**118,900 AI 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%**

\* 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.

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



# 04

## Attractive Operating Costs and Incentives



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

**1<sup>st</sup>** clinical trials and life sciences R&D centre<sup>1</sup>

**1<sup>st</sup>** Software development centre

**2<sup>nd</sup>** bio-pharma manufacturing<sup>2</sup>

**2<sup>nd</sup>** medical devices manufacturing plant

Source: fDi Benchmark, 2020.

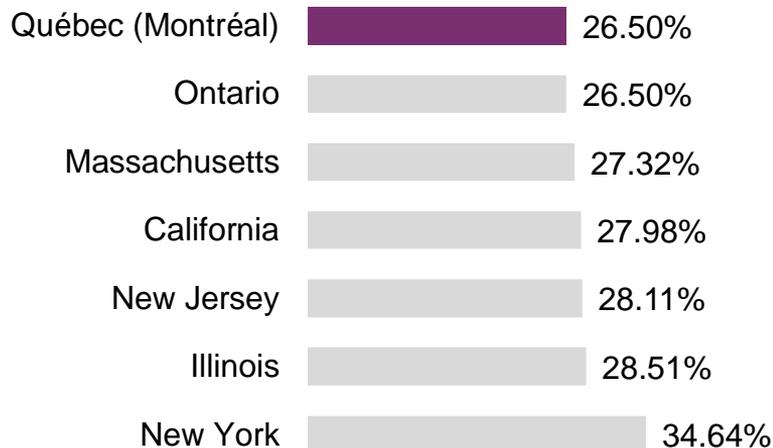
1: Research, discovery, design, development or testing of biotechnology or pharmaceutical related products and/or medical devices.

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 corporate effective tax rate (%)**  
Selected Canadian provinces and U.S. States, 2020



# 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	\$38,168	\$40,743	\$47,678	\$53,055	\$57,533	\$55,554	\$62,386
Laboratory Supervisor	\$57,483	\$61,235	\$75,948	\$85,049	\$90,998	\$92,823	\$99,710
Scientific Researcher	\$58,074	\$61,871	\$77,517	\$88,241	\$92,746	\$94,716	\$101,655
Pharmaceutical Detailer	\$59,651	\$66,197	\$87,293	\$91,975	\$101,628	\$110,153	\$107,949
Laboratory Head	\$65,220	\$69,604	\$83,163	\$93,842	\$101,569	\$96,302	\$118,822
Biochemist	\$70,412	\$78,225	\$100,352	\$111,032	\$113,859	\$122,308	\$126,092
R&D Manager (technical)	\$93,625	\$99,552	\$145,441	\$148,269	\$161,778	\$169,144	\$177,451

\* Base salaries based on 5 years of experience, for the Pharmaceuticals industry (NAICS 3254).

Currency exchange CA\$1 = US\$0.72.

Source: Economic Research Institute Inc., May,2020.

# 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
<b>Quality Assurance Specialist</b>	<b>\$46,987</b>	\$50,182	\$64,983	\$67,243	\$70,619	\$71,395	\$77,687	\$82,744
<b>Clinical Liaison</b>	<b>\$48,475</b>	\$51,856	\$64,023	\$69,060	\$70,549	\$72,848	\$75,686	\$83,116
<b>Project Management Specialist</b>	<b>\$49,134</b>	\$52,708	\$64,251	\$68,201	\$67,965	\$70,323	\$76,565	\$82,896
<b>Regulatory Affairs Specialist</b>	<b>\$54,790</b>	\$58,711	\$73,270	\$77,753	\$76,527	\$79,505	\$86,553	\$93,902
<b>Manufacturing Engineer</b>	<b>\$60,265</b>	\$64,136	\$84,097	\$91,589	\$89,795	\$93,696	\$98,279	\$104,457
<b>Field Service Manager</b>	<b>\$63,851</b>	\$67,413	\$ 92,067	\$97,846	\$ 97,518	\$100,912	\$109,781	\$119,634
<b>Mechanical Engineer</b>	<b>\$66,722</b>	\$70,821	\$96,508	\$104,962	\$101,776	\$106,528	\$111,375	\$118,889
<b>Project Leader</b>	<b>\$67,522</b>	\$72,231	\$101,063	\$106,866	\$103,321	\$109,666	\$1116,500	\$126,748
<b>Software Developer</b>	<b>\$67,954</b>	\$72,058	\$100,264	\$105,769	\$101,952	\$108,337	\$113,523	\$125,464
<b>Production Manager</b>	<b>\$73,750</b>	\$78,749	\$106,384	\$114,101	\$109,002	\$113,338	\$123,317	\$134,021

\* Base salaries based on 5 years of experience, Medical Device Manufacturing (NAICS 3391).

Currency exchange CA\$1 = US\$0.72.

Source: Economic Research Institute, Inc., May 2020.

# Low mandatory benefit costs for employers

## Examples of mandatory benefit costs for employers, 2020

Gross annual salary*	\$50,000	\$100,000	\$125,000
Québec Public Pension Plan (employee: 5.7%; employer: 5.7%, max. \$3,146.40)	\$2,850.00	\$3,146.40	\$3,146.40
Québec Parental Insurance Plan (employee: 0.494%, employer: 0.692%, max. sal. of \$78,500)	\$346.00	\$543.22	\$543.22
Employment Insurance (employee: 1.20%, employer: 1.68%, max. sal. of \$54,200)	\$840.00	\$910.56	\$910.56
Health Services Fund (max. 4.26% if global salary total is more than \$6M)	\$2,130.00	\$4,260.00	\$5,325.00
Commission des normes du travail (Labour standards board) (0.07%, max. sal. of \$78,500)	\$35.00	\$54.95	\$54.95
Commission de la santé et sécurité du travail (Occupational health and safety board) (0.44% in service sector, max. sal. of \$78,500)**	\$220.00	\$345.40	\$345.40
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
<b>Total benefit costs</b>	\$6,921.00	\$10,260.53	\$11,599.08
<b>Total cost</b>	<b>\$56,921.00</b>	<b>\$110,260.08</b>	<b>\$136,575.53</b>
<b>Total benefits in % of gross annual salary</b>	<b>13.84%</b>	<b>10.26%</b>	<b>9.26%</b>

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 0.44%. The average premium rate in 2020 is \$1.85 per \$100 of payroll.

Source: Revenu Québec, 2020.

# Various incentives tailored to your project



Canada

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



Québec

- ▶ ESSOR Fund for Major Projects
- ▶ Tax credits for Large Investment Project
- ▶ 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



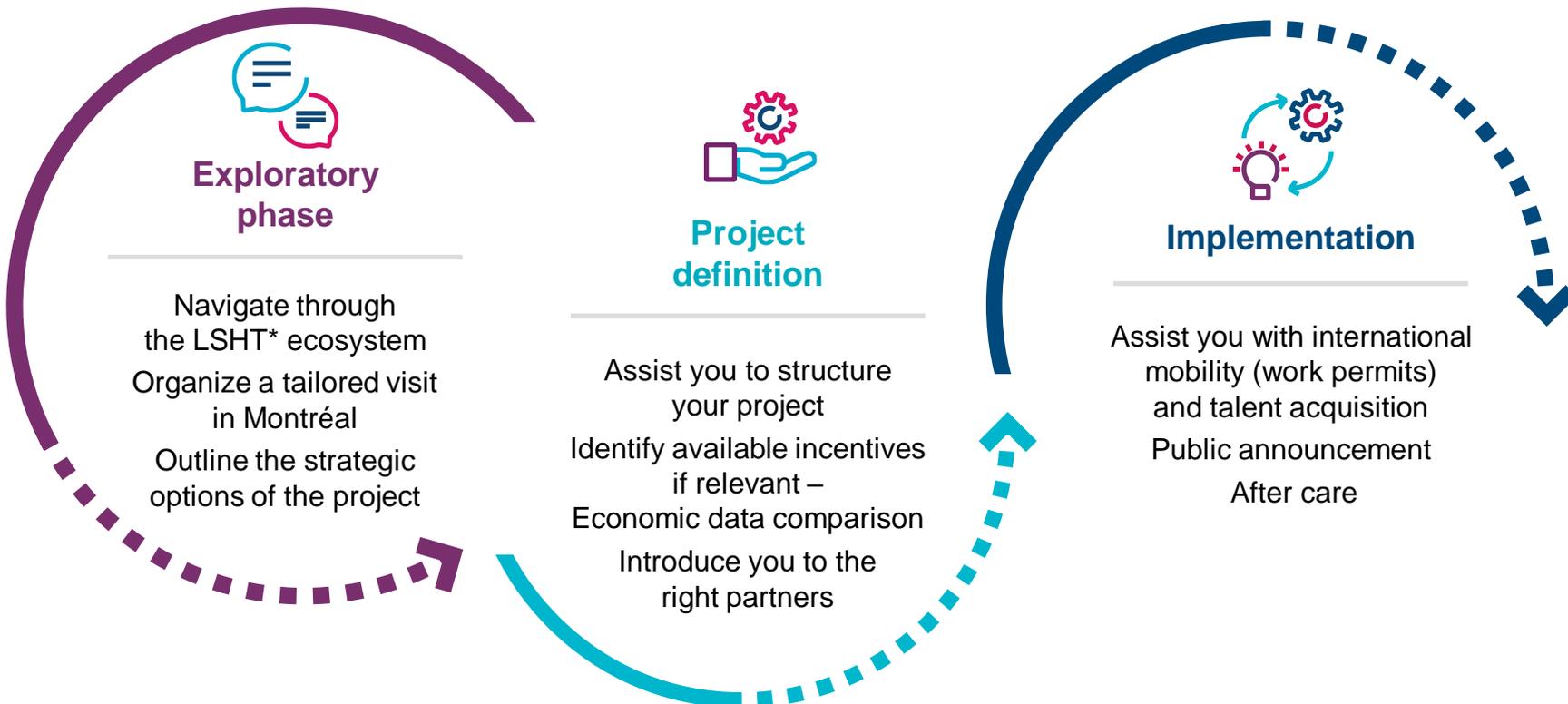
Sustainable development programs are also available at the municipal level

# 05

## Montréal International's Personalized, Free and Confidential Services



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





## Contact us



Montréal  
International

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