

# HAMILTON LIFE SCIENCE

## CLUSTER REPORT 2022

Canada's Leading Life Science  
Research & Education Cluster







## Message from The Synapse Consortium Director

Hamilton's life science cluster had another fantastic year in 2022, with transformational research and discovery underpinning the commercialization efforts of innovative companies across the region. This success is seen in both large and small ventures, such as OmniaBio's \$580-million ground-breaking of Canada's largest manufacturing facility exclusively for cell and gene therapies. At the same time, startup ToeFX reached the milestone of serving 100 clinics from British Columbia to Newfoundland. There has been a lot happening in Hamilton!

Leveraging world-class research infrastructure, innovative startups will continue to work on transforming discoveries into products and services. Hamilton is driving innovation in areas such as infectious diseases, personalized medicine, and medical devices. Our community is making breakthroughs that have the potential to transform healthcare not only in Hamilton but around the world.

From McMaster University's world-class research facilities to nationally recognized research hospitals, Hamilton Health Sciences and

St. Joseph's Healthcare Hamilton to the thriving network of startups and established companies, Hamilton is recognized as a global leader in life science innovation and entrepreneurship.

Our city's strength lies in the collaborative spirit of our researchers, entrepreneurs, and healthcare providers, who together are tackling the most pressing health challenges of our time – whether it is resolving last-mile vaccine storage and transportation, developing new COVID vaccines, empowering antibiotics drugs, or creating a diabetes treatment that allows one insulin shot a year rather than once a day.

The Community has taken note, with the City of Hamilton releasing a comprehensive Life Science Strategy to guide the cluster's growth over the coming decade.

Hamilton should be proud of the progress made in recent years, though this is no time to rest on our laurels. Looking forward to 2023, we must build on this momentum to take advantage of the opportunities that now present themselves. Together, we will continue to drive innovation, create new jobs, and improve the health and well-being of people in Hamilton and around the world.

Alex Muggah, Director



# Executive Summary

## Hamilton's Life Science Cluster Update for 2022

First published in 2021, the Life Science Cluster Report provides foundational statistics about the composition and size of the Hamilton life science cluster. Based on survey responses from organizations with a presence in Hamilton, this report highlights key statistics across a variety of ecosystem characteristics, including organization structures, labour force, research and innovation, facilities as well as sentiment about the state of the Hamilton life sciences cluster.

Hamilton is one of the most vibrant mid-sized life sciences clusters in North America and has grown considerably over the past year. In 2022, Hamilton was home to 217 identified public- and private-sector organizations that together employed 46,912 people, an increase of 2,175 reported in our 2021 survey. Taken together, surveyed organizations in Hamilton had total operating budgets in 2022 of \$5.6 billion.

With 31,583 undergraduate and graduate STEM students enrolled in Hamilton academic institutions in 2022, there was a strong talent pool to support companies and more than 5,400 researchers/faculty.

Leveraging this talent, more than half a billion was spent in Hamilton on innovative research in 2022. Led by McMaster University, Mohawk College, Hamilton Health Sciences, and St. Joseph's Healthcare, Hamilton's public-sector organizations saw \$473.8 million in sponsored research spending, with a further \$31.6 million invested by private-sector companies on research and development activities.

The private sector in Hamilton is anchored by McMaster Innovation Park (MIP), a life sciences mega-hub currently home to more than 100 companies in the life sciences, technology, and advanced manufacturing sectors. Most notable in 2022 was the arrival of OmniaBio Inc., which leveraged a \$40-million investment from the Province of Ontario to build a 200,000 square-foot, \$580-million bio-manufacturing facility at the Park. OmniaBio Inc. is set to become an engine for innovation and manufacturing in Canada, and is expected to employ over 250 people once up and running.

A qualitative assessment of the Hamilton ecosystem by survey respondents found improvement or stable scores in 9 of 13 quantitative dimensions, including: the ecosystem's capacity to develop novel digital health products, leadership in translational research, and the availability of high-quality scientists and entry-level employees. The community identified areas for improvement in some areas such as access to management talent, public funding, and the relative cost of doing business compared to other regions.

We would like to thank all those who responded to the 2022 cluster survey and made this report possible. While best efforts were made to reach all organizations in the Hamilton ecosystem, we understand that not everyone was able to respond.

Taken together, the 2022 Cluster Report paints a positive picture, showcasing the strengths of the Hamilton life sciences ecosystem which continues to grow, adding new organizations that are contributing to a strong and diverse cluster.



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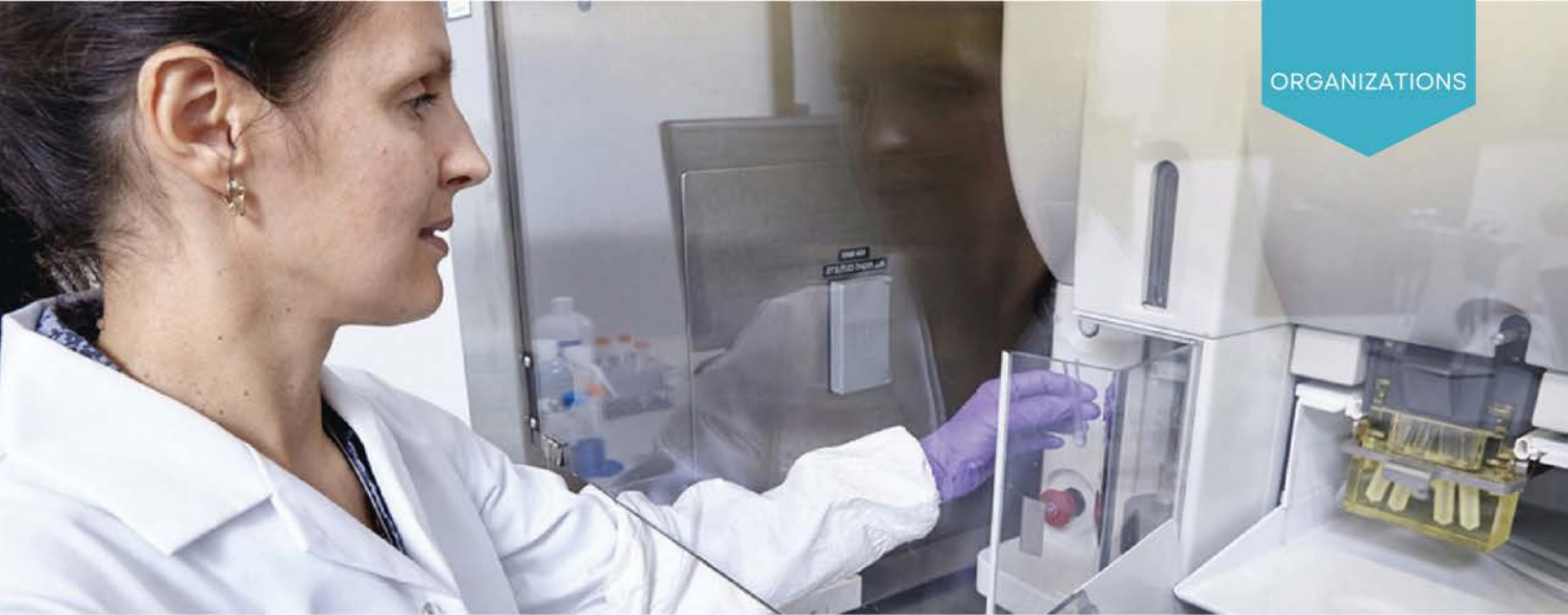
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Directory of Hamilton Life Sciences Organizations







# Life Science Organizations and their impact in Hamilton

Through the 2022 Cluster Survey, Synapse identified 217 private- and public-sector organizations operating in Hamilton's life science cluster. These companies represent a broad cross-section of the ecosystem of focus and specialization, with the largest sub-sectors including medical devices/diagnostics, followed by

biotechnology/pharmaceuticals, digital health, and more. Hamilton's areas of strength reflect the capacity of both large and small organizations as many companies have been choosing Hamilton as their go-to location; expect to see an increase in the company formation over coming years, adding to the growing network in the region.



## RECENT GROWTH OF ORGANIZATIONS IN HAMILTON'S LIFE SCIENCE CLUSTER

Hamilton was home to **217** health science organizations employing **46,912** people, an increase of **2,175** since 2021, contributing **\$5.5 billion** to the local economy.



# Life Science Cluster

## Supercharging Economic Growth in Hamilton

Total funding raised by life science organizations in Hamilton has increased over the past year. Even with the headwinds of an economic downturn, both private and public organizations were able to secure an increase in total funding, including both dilutive and non-dilutive investments for the private sector totaling more than \$637 million.

Annual research funding for life science organizations also increased in 2022, with Hamilton’s publicly funded academic and hospital institutions securing a total of \$474 million to conduct basic and translational research, much of it in concert with private sector organizations. Private sector firms were responsible for an additional \$32 million in R&D expenditures in 2022.



**Total funding** from public- and private-sector sources **increased to over \$637 million**



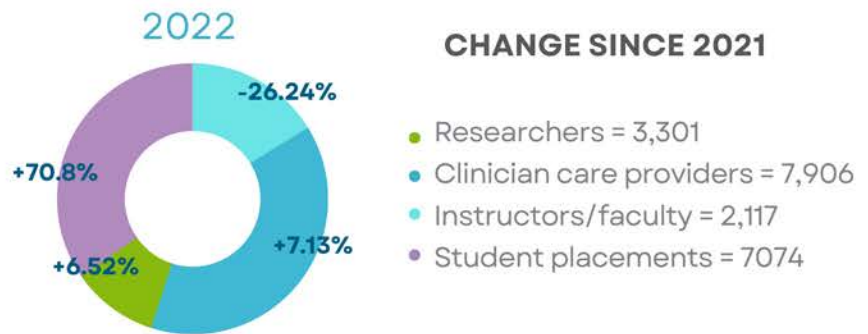
# Labour Fource

## Hamilton's Life Science Cluster Employee Talent

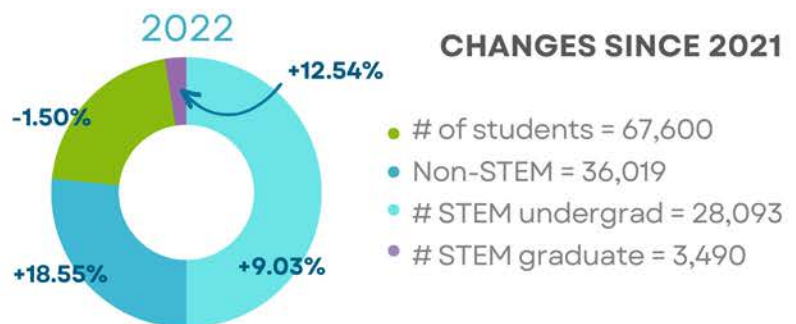
Hamilton's life science labour force covers full-time and part-time employees in both the public and private sectors, including those in research and development roles, clinicians, teaching faculty, students and co-ops.

Based on survey responses, the reported number of employees within the life science ecosystem has increased by more than 10% over the past year. In 2022, there were significant increases in the number of researchers, clinician providers, and students on placement, while instructors and faculty members decreased.

### LIFE SCIENCE EMPLOYEES



### UNDERGRADUATE AND GRADUATE STUDENT POPULATION:





# Innovation, Ideas and Facilities

## Patents and Commercialization

Over the past year, an abundance of action took place to bring ideas and discoveries to market. In 2022, survey respondents identified 92 discoveries and ideas with commercialization potential, while securing a further 99 patents, bringing the total number of patents issued since 2016 to 504. A significant increase in the number of ideas that have been commercialized or licensed were reported this year, reflecting the strength of surveyed organizations.

**504** total patents  
since 2016

**494** commercialized  
or licensed  
ideas since 2016



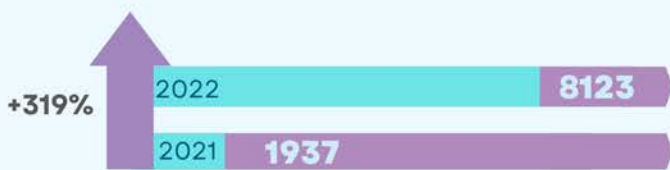
**NUMBER OF DISCOVERIES WITH  
COMMERCIALIZATION POTENTIAL**



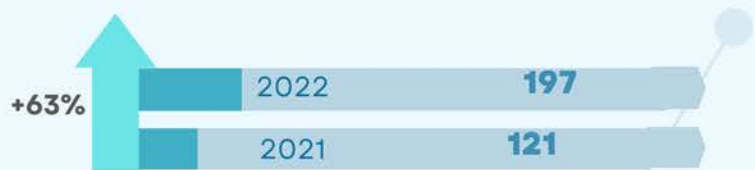


# Canada's Research & Innovation Hub Recent Publications and Clinical Trials

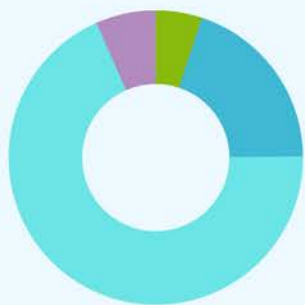
Ongoing research activity continues to be a priority and strength within the Hamilton Life Science Cluster. We saw a 319% increase in the number of reported publications, which may reflect capturing prior years' efforts, while the 197 ongoing clinical trials at the end of 2022 underscored the research expertise in the region.



PUBLICATIONS IN LAST 12 MONTHS



CLINICAL TRIALS (LAST 12 MONTHS)



### 2022 CLINICAL TRIAL STUDIES

- Phase 1 - 10 trials
- Phase 2 - 39 trials
- Phase 3 - 135 trials
- Phase 4 - 13 trials

**Clinical trials & publications saw a marked increase in 2022, underscoring research expertise in the Cluster.**





# Facilities and Capacity

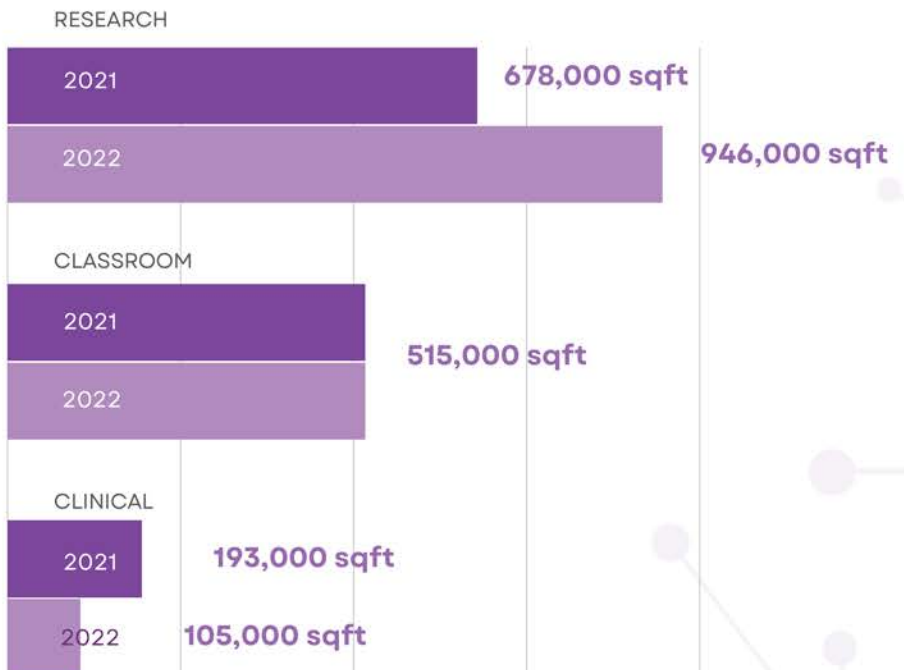
## Ecosystem Facilities

Situated in the Goldilocks zone for health innovation, Hamilton is large enough to make a global impact, but small enough to allow for ample collaboration and access to resources across the cluster.

In 2022, Hamilton had significant life sciences facility capacity with 9.6 million sq. ft. in total facility space reported by survey respondents. Total lab space amounted to 1.36 million sq. ft., while research lab space increased while the amount of space under construction increased by 260,000 sq. ft.

OmniaBio Inc. broke ground building the first phase of a 400,000 sq. ft. biomanufacturing space, creating Canada's largest CDMO exclusively manufacturing for cell and gene therapy at McMaster Innovation Park, further to Hamilton's life science ecosystem.

### RESEARCH, CLASSROOM AND CLINICAL SPACES



Research lab space saw a **39.4% increase in 2022** while (classroom space had no change) **clinical lab space decreased 45.7%** over 2021.



# Facilities and Capacity

## Hospital Capacity

Hamilton is a regional centre for health care and professional training with two large research hospital networks, anchored by Hamilton Health Sciences and St. Joseph's Healthcare Hamilton, anchoring the community. Together these two hospitals serve a catchment area of more than 2.3 million people. In 2022, different trends were seen affecting the capacity of these hospital networks. The number of emergency room visits and hospital beds increased, while 70,000+ patient admissions were reported during the year. Government mandates set to limit the number of non-urgent surgeries, resulted in a decrease in overall surgeries performed throughout the year.

### RECENT TRENDS IN HOSPITAL NETWORK CAPACITIES





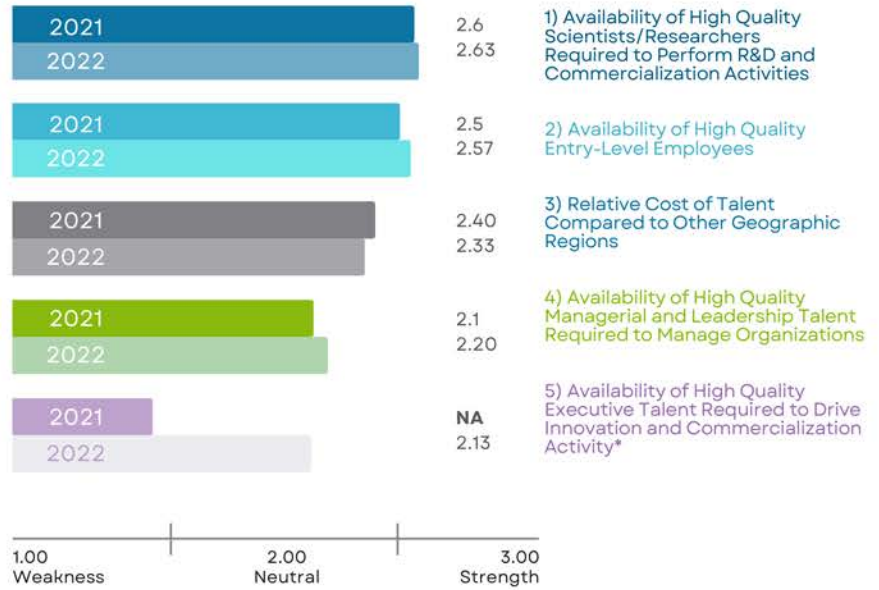
# Voice of the Cluster

Through the 2022 survey, organizations were asked about their general sentiments regarding the strength and robustness of the Hamilton life science cluster across four key categories:

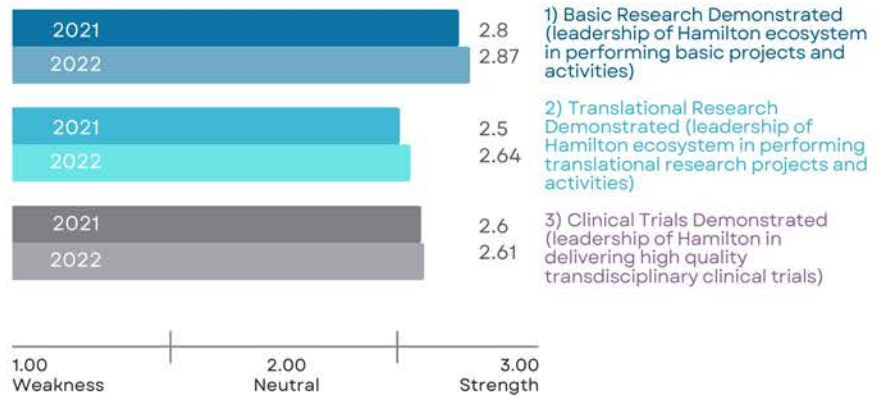
- (1) Organizations and Personnel
- (2) Innovation and Research
- (3) Investment and Funding
- (4) Infrastructure and Facilities.

These qualitative questions help us to gauge and quantify Hamilton's performance as a life science cluster.

## QUALITATIVE FEEDBACK ON ORGANIZATIONS & PERSONNEL



## QUALITATIVE FEEDBACK ON INNOVATION & RESEARCH

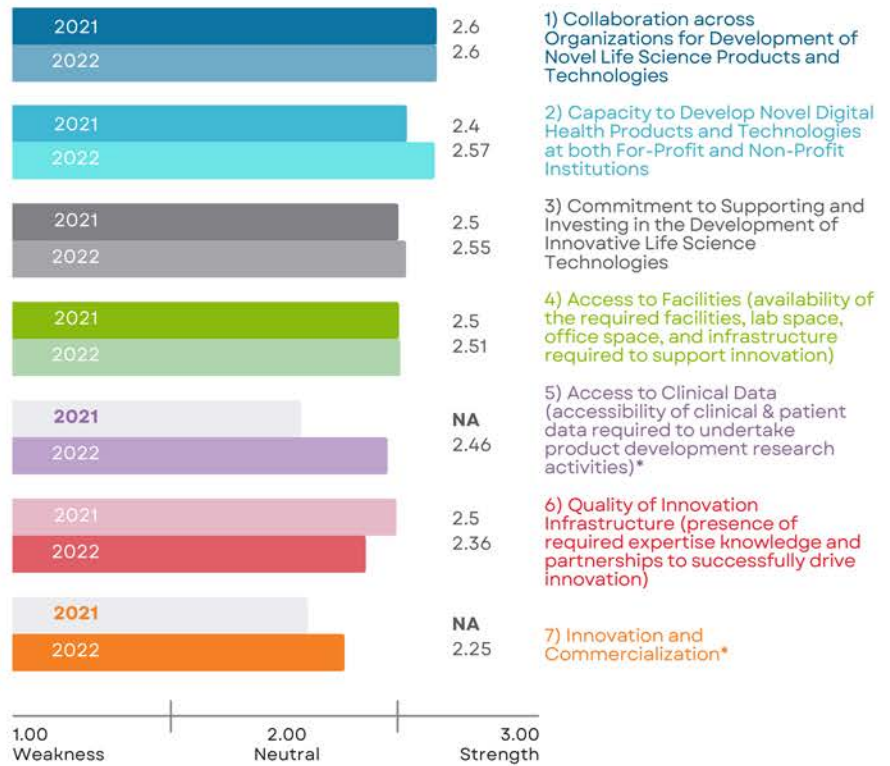


\*Note: three additional qualitative questions were asked in the 2022 Cluster Survey that do not have comparative data from 2021 and are indicated with "N/A" under the 2021 column.

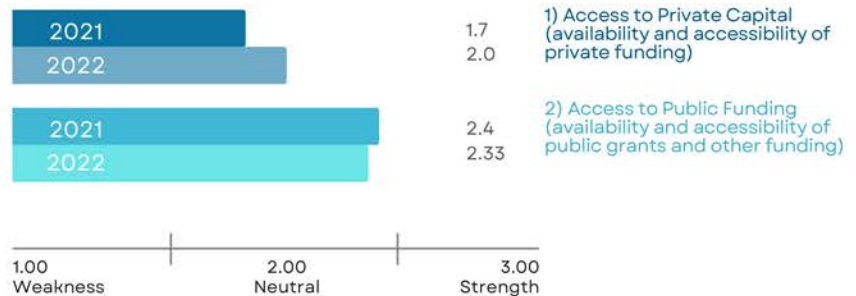


# Voice of the Cluster

## QUALITATIVE FEEDBACK ON INFRASTRUCTURE & FACILITIES



## QUALITATIVE FEEDBACK ON INVESTMENT AND FUNDING



\*Note: three additional qualitative questions were asked in the 2022 Cluster Survey that do not have comparative data from 2021 and are indicated with "N/A" under the 2021 column.



# Looking Forward

## Map of Partner Organizations

As demonstrated through the 2022 Synapse Cluster Report, Hamilton's life science ecosystem has experienced significant growth over the past year. As new life science companies continue to be founded and existing companies grow, the cluster is expected to continue in an upwards trajectory and lead in life science research, commercialization, and innovation.

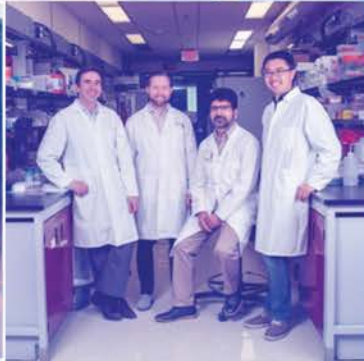
Over the past year, we saw improvements in key areas of strength, including research funding, labour force participation, student talent, innovative research, and clinical capacity, further demonstrating the

opportunities for Hamilton's life science cluster. Looking to the future, Synapse expects the positive trends will continue in the areas of investment, company attraction, and new company formation.

This annual cluster report aims to support the Synapse Consortium, its partner organizations, and the broader community in staying up to date on key indicators tracking performance of the cluster. The Synapse Consortium is always open to feedback on ways to enhance future surveys and reports.







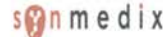


THE FORGE



Accelerators, Incubators & Financing

exerKINE



Biotech & Pharmaceuticals



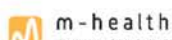
Contract, Professional and Other Services



Government and Non-Profits

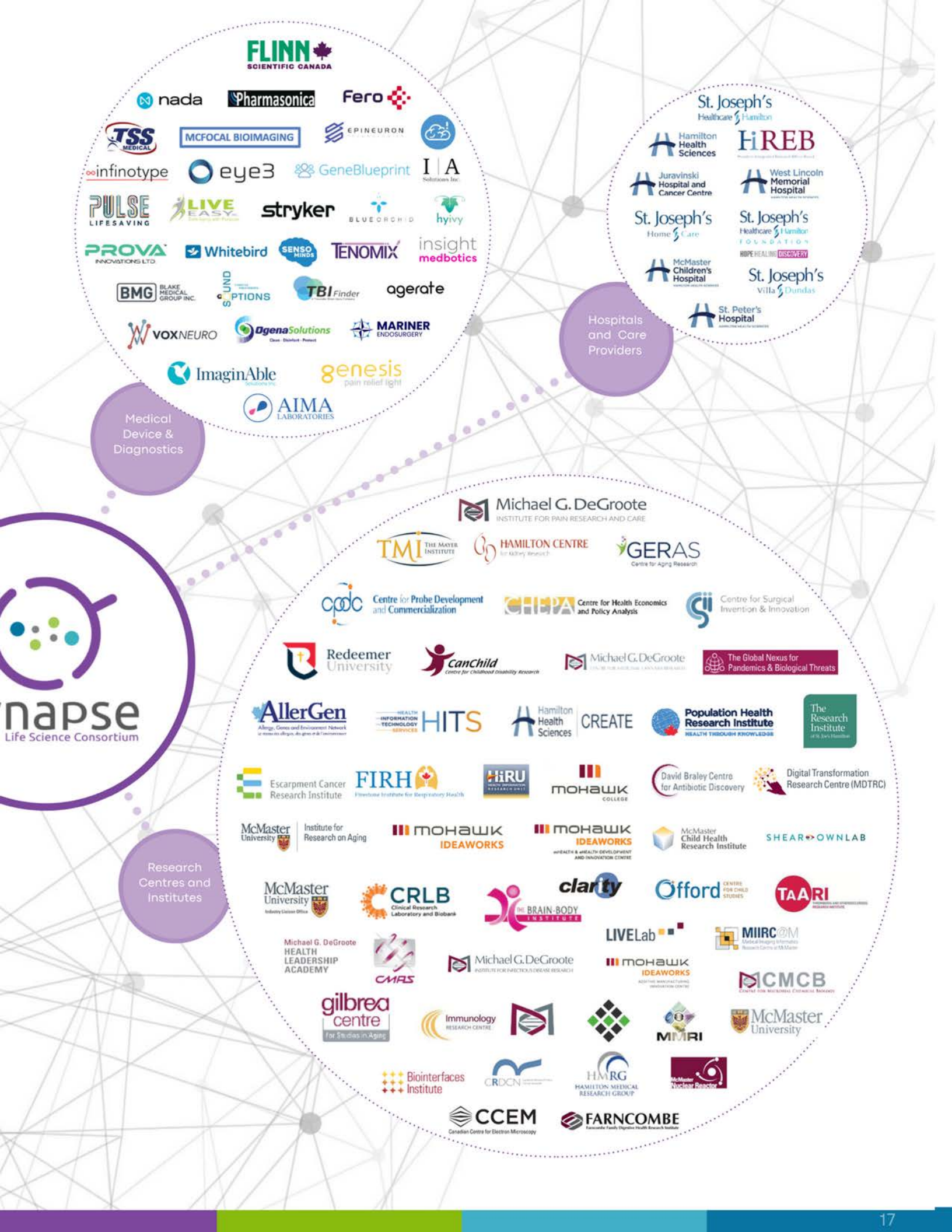


MEDTEL SOFTWARE LTD



Digital Health/ e-Health





**FLINN**  
SCIENTIFIC CANADA

nada

Pharmasonica

Fero

TSS MEDICAL

MCFOCAL BIOIMAGING

EPINEURON

I | A Solutions Inc.

infinotype

eye3

GeneBlueprint

I | A Solutions Inc.

PULSE LIFESAVING

LIVE EASY

stryker

BLUEORCHID

hyivy

PROVA INNOVATIONS LTD.

Whitebird

SENSO MINDS

TENOMIX

insight medbotics

BMG BLAKE MEDICAL GROUP INC.

SCUPTIONS

TBI FINDER

agerate

VOXNEURO

Ogena Solutions

MARINER ENDOSURGERY

ImaginAble

genesis pain relief light

AIMA LABORATORIES

Medical Device & Diagnostics

Hospitals and Care Providers

St. Joseph's Healthcare Hamilton

Hamilton Health Sciences

HiREB

Juravinski Hospital and Cancer Centre

West Lincoln Memorial Hospital

St. Joseph's Home Care

St. Joseph's Healthcare Hamilton FOUNDATION

McMaster Children's Hospital

HOPE HEALING DISCOVERY

St. Joseph's Villa Dundas

St. Peter's Hospital



napse Life Science Consortium

Research Centres and Institutes

Michael G. DeGrootte INSTITUTE FOR PAIN RESEARCH AND CARE

TMJ THE MAYER INSTITUTE

HAMILTON CENTRE for Military Research

GERAS Centre for Aging Research

CPDC Centre for Probe Development and Commercialization

CHHPA Centre for Health Economics and Policy Analysis

Centre for Surgical Invention & Innovation

Redeemer University

CanChild Centre for Childhood Disability Research

Michael G. DeGrootte

The Global Nexus for Pandemics & Biological Threats

AllerGen Allergy, Genes and Environment Network

HITS HEALTH INFORMATION TECHNOLOGY SERVICES

Hamilton Health Sciences CREATE

Population Health Research Institute HEALTH THROUGH KNOWLEDGE

The Research Institute at St. Joseph's Hamilton

Escarpment Cancer Research Institute

FIRH FIMESIME INSTITUTE FOR RESPIRATORY HEALTH

HiRU RESEARCH UNIT

MOHAWK COLLEGE

David Braley Centre for Antibiotic Discovery

Digital Transformation Research Centre (MDTRC)

McMaster University Institute for Research on Aging

MOHAWK IDEAWORKS

MOHAWK IDEAWORKS HEALTH & WELLNESS DEVELOPMENT AND INNOVATION CENTRE

McMaster Child Health Research Institute

Shear-OwLab

McMaster University Industry Liaison Office

CRLB Clinical Research Laboratory and Biobank

clarity THE BRAIN-BODY INSTITUTE

Offord CENTRE FOR CHILD STUDIES

TAAARI

Michael G. DeGrootte HEALTH LEADERSHIP ACADEMY

CMRS

Michael G. DeGrootte INSTITUTE FOR INFECTIOUS DISEASE RESEARCH

LIVELab

MIIRC@M Central Imaging Informatics Research Centre at McMaster

gilbrea centre for Studies in Aging

Immunology RESEARCH CENTRE

CMCB

MMRI

McMaster University

Biointerfases Institute

CRDCN

HMRG HAMILTON MEDICAL RESEARCH GROUP

McMaster Nuclear Reactor

CEM Canadian Centre for Electron Microscopy

FARNCOMBE

# Appendix A

## Survey Methodology and Results

\*Disclaimer: If a company responded in 2021 but not in 2022, its data was aggregated with the 2022 data as it was assumed that the data had not significantly changed over the past year. As a result, the 2022 data may appear to have increased in number compared to the 2021 data.

In total, 217 organizations met the survey criteria, and 188 had direct contact information with Synapse Life Science Consortium to receive the 2022 Cluster Survey. These organizations were sent the 2022 Synapse Cluster Survey which covered basic organizational, financial, employee, and innovation data. A response rate of 61% was achieved.



# Appendix A

## Data from Hamilton Ecosystem Organizations

An environmental scan was conducted of the life sciences activity in Hamilton and surrounding regions prior to launching the Synapse Cluster Report survey. Efforts were made to take into account the changes that occurred among organizations since the 2021 Synapse Cluster Report survey.

Similar to 2021, the criteria included any organization with staff located in Hamilton, with activities that directly (e.g., for-profit company, research centres, hospitals, etc.) or indirectly (e.g., professional services, specialized capital, accelerators, etc.) contribute to Hamilton's life science ecosystem.

### CLUSTER SURVEY - HAMILTON ECOSYSTEM ORGANIZATIONS

Data Point	2021	2022
<b>1. For-profit, with headquarters located outside Hamilton:</b>		
How many full-time equivalents are currently employed at your Hamilton location(s)?	580	617
How many individual people are currently employed at your Hamilton location(s)?	638	675
How many individuals employed based in Hamilton work in a R&D role?	68	93
What is your organizational annual budget for your Hamilton location(s)?	\$39.7M	\$44.9M
<b>2. For-profit, primarily located in Hamilton:</b>		
How much non-dilutive capital has your organization raised in the last five years?	\$49.4M	\$71.3M
How much investment has your organization raised in the last five years?	\$55.7M	\$92.3M
What is your organization's current annual budget?	\$42.6M	\$67.2M
What percent of the annual budget is allocated to R&D?	\$14.3M	\$31.1M
What was your organization's revenue for the previous fiscal year?	\$27.1M	\$48.9M
How many full-time equivalents are currently employed by your organization?	182	409
How many individual people are currently employed by your organization?	220	528
How many of these individuals are working in R&D?	104	251
How many patents does your organization own?	68	95
How many products is your organization currently in the process of commercializing?	55	577
How many products has your organization successfully commercialized and brought to market in the last five years?	34	185
<b>3. Non-profit, primarily located in Hamilton:</b>		
What is your organization's current annual budget?	\$63.5M	\$70.5M
How many full-time equivalents are currently employed by your organization?	731	888
How many individual people are currently employed by your organization?	842	972
How many of these individuals are working in a research-related role?	568	581
How many patent filings has your organization contributed to in the previous five years?	17	20
How many collaborative research projects have you undertaken in the previous 12 months with external organizations?	160	236

*\*Disclaimer: to account for corporate privacy, respondents were encouraged to provide a range for reported financial values. Where provided, the median value of each range was used.*

# Appendix A

## Synapse Consortium Partner Organizations

A more comprehensive survey was conducted for the 9 core Synapse Life Science Consortium partners: Bay Area Health Trust, City of Hamilton, Hamilton Chamber of Commerce, Hamilton Health Sciences, Innovation Factory, McMaster Innovation Park, McMaster University, Mohawk College, and St. Joseph's Healthcare Hamilton.

Each partner responded to questions that directly related to their operations. Certain questions have been omitted from the results to preserve confidentiality. Employee, budget, funding, and innovation data were aggregated among all surveys, while talent, facilities, and capacity data are only represented by partners.

### CLUSTER SURVEY - SYNAPSE PARTNER ORGANIZATIONS

Data Point	2021	2022
<b>1. Employee Information</b>		
Total employees	40,629	44,737
• Full-time employees	9,707	15,472
• Part-time employees	5,761	8,567
Total individuals employed by function:		
• Faculty/Teaching/Instructors	2,870	2,117
• Clinicians/Nurses/Care Providers/Physicians	7,380	7,906
• Principal Investigators/Research Scientists (exclude teaching/clinical appointment)	3,099	3,301
• Student placements (e.g. Interns, Co-ops, Work-Integrated Learning Placement)	4,143	7,074
Total volunteers	2,329	1,600
<b>2. Talent</b>		
Total Number of Students (2021-22 Academic Year)	62,004	67,602
• STEM undergraduate students	28,251	28,093
• of STEM graduate students	3,101	3,490
• of STEM graduate students graduated	7,172	5,903
<b>3. Physical Capacity</b>		
Total Space (sq.ft.) of all Facilities	10,433,000	9,891,000
Vacancy space	149,000	5,962
Space under construction	15,000	275,000
Total Lab Space (sq.ft.)	1,386,000	1,356,000
Clinical lab space	193,000	105,000
Research lab space	678,000	945,000
Classroom lab space	515,000	515,000
# of hospital beds	2,132	2,273
# of emergency room visits	254,385	285,506
# of patient admissions	97,433	70,979
# of surgeries performed	52,878	46,742



# Appendix A

## Synapse Consortium Partner Organizations

### CLUSTER SURVEY - HAMILTON ECOSYSTEM ORGANIZATIONS

Data Point	2021	2022
<b>1. Financial</b>		
Annual operating budget	\$5.562 B	\$5.4 B
Total sponsored research (\$ amount)	\$447.5 M	\$473.8 M
Source of total research spending (% of total)		
• Industry funding	26.50%	42.69%
• Government/NP funding	64.10%	47.84%
• Internal	5.30%	5.49%
• Other	2.50%	3.82%
Total \$ amount of salary and wage expenses in previous FY	\$3.049 B	\$2.659 B
Previous FY total revenue	N/A	\$1,213 B
<b>2. Research Capacity</b>		
Total # of publications:		
In the last 12 months	1,937	8,123
In the last 5 years	8,700	42,633
Idea creation (since 2016)		
# of discoveries with commercialization potential	109	92
# of ideas that have been commercialized or licensed	49	494
# of patent filings your organization has contributed to	320	99
Total # of research projects		
Ongoing	235	414
Last 12 months	510	1,026
Last 5 years	3,982	2,210
Ongoing research projects conducted in collaboration with an industry partner	143	2
Total # of clinical trial studies hosted		
Currently	121	197
Last 5 years	607	625
Number of current clinical trials in each phase		
Phase 1	27	10
Phase 2	75	39
Phase 3	194	135
Phase 4	36	13
Pilot/another phase	27	16

*\*Disclaimer: The total number of employees provided for the 2021 Partner organizations was inaccurate and has been updated from 34,949 to 40,629 to reflect the correct value. The employee values for Partner organizations may vary depending on the reporting organization due to cross-appointments of professionals within the life sciences ecosystem. For example, a faculty member at an academic institution may also work in one of the hospital systems and be a founder or advisor for a private organization within Hamilton, ON.*



# Appendix B

## 2022 Directory of Synapse Consortium Partner Organizations



### BAY AREA HEALTH TRUST

At the intersection of health, life sciences and business, Bay Area Health Trust is an example of a successful partnership between hospitals and the for-profit private sector. Bay Area Health Trust is a Hamilton, Ontario-based company that operates life science businesses and invests in growth-oriented opportunities.

- Made up of seven business entities providing critical services to customers in Hamilton and across Canada, including clinical trial logistics (Bay Area Research Logistics), document management (Bay Area Records) and real estate (Bay Area Real Estate).
- Helping to commercialize a novel molecular transport medium for safe and effective COVID-19 sample testing that has been utilized across Canada

<https://bayareahealthtrust.com/>



### CITY OF HAMILTON ECONOMIC DEVELOPMENT

Life sciences industries in Hamilton are a significant part of the research and innovation landscape, supporting improved healthcare products and services as well as bioengineering and cellular research.

- Named one of Canada's top ten places to invest
- Ranked second in Canada for youth to work by RBC's Youthful Cities Work Index Study
- Ranked as the second overall North American Mid-Sized City of the Future by fDi Intelligence

<https://investinhamilton.ca/industries/life-sciences/>



### HAMILTON CHAMBER OF COMMERCE

For 175 years, the Hamilton Chamber of Commerce has been facilitating connections and collective action to strengthen the economic engine of the City of Hamilton. The Chamber has harnessed the collective ambition of its thousands of members to play a leading role in Hamilton's commercial success. They are an ambitious organization that strives to meet the various needs of their small business members. Collectively support 1,144 members in the Hamilton community.

<https://www.hamiltonchamber.ca/>





# Appendix B

## 2022 Directory of Synapse Consortium Partner Organizations

### HAMILTON HEALTH SCIENCES

Hamilton Health Sciences is a community of 15,000 staff, physicians, researchers, and volunteers that proudly serves southwestern Ontario. It is the most comprehensive hospital network in Ontario, and the only hospital in the province that cares for all ages, from pre-birth to end-of-life. As the largest employer in Hamilton, Hamilton Health Sciences plays a vital role in training the next generation of health professionals.

- Ranked as the number four research hospital in Canada in 2020
- Largest employer in the city of Hamilton
- \$5.7 million Canadian Institute of Health Research Grant awarded for Sepsis research
- Named to Forbes Canada's best employers 2021

<https://www.hamiltonhealthsciences.ca/>



### INNOVATION FACTORY

Innovation Factory is Hamilton's catalyst for tech innovation. The factory provides entrepreneurs with business services, training, mentorship, and strategic connections to help bring disruptive technologies to market, increase revenues, attract investment, and create jobs. Since 2011, Innovation Factory has served as the regional innovation centre for the City of Hamilton, accelerating the growth of local companies.

- Met with over 2,7000 unique companies and clients since inception
- Ventures have received \$425+ million in funding across all industrial sectors

<https://innovationfactory.ca/>



### MCMASTER INNOVATION PARK

McMaster Innovation Park is where companies come to grow. It supports start-ups, business, and research by offering a collaborative space to transform ideas from vision to commercial reality. The Park bridges academia and industry by supporting researchers, offering accelerator and incubator programs, and connecting industry with major academic institutions such as McMaster University.

- Constructing over 2.8 million square feet of custom, scalable office and wet lab space
- Will house 5,000 employees at full build-out

<https://mcmasterinnovationpark.ca/>



# Appendix B

## 2022 Directory of Synapse Consortium Partner Organizations



### MCMASTER UNIVERSITY

One of only four Canadian Universities consistently ranked in the world's top 100, McMaster has a proud tradition of academic and research excellence. McMaster University collaborates across disciplines to solve some of the world's toughest challenges, working together to improve people's lives and contributing to their global knowledge base.

- Named Canada's 2nd most research-intensive university in 2022
- Ranked in the world's top 70 by the Times Higher Education World University Rankings in 2022
- Home to over 70 research centres and institutes
- Named one of Hamilton-Niagara's top employers for five consecutive years

<https://www.mcmaster.ca/>



### MOHAWK COLLEGE

Mohawk College ranks among the top 20 colleges in Canada for applied research, with a focus on electronic and mobile health solutions, additive manufacturing, and energy distribution. Recognized as a leader in health and technology education, Mohawk College is also one of the largest trainers of apprentices in Ontario.

- Named one of Canada's greenest employers for eight consecutive years
- Named one of Hamilton-Niagara's top employers for eight consecutive years
- 86% of graduates are working within six months of graduating
- Ranked in top 10 research colleges in Canada since 2020

<https://www.mohawkcollege.ca/>



### ST. JOSEPH'S HEALTHCARE HAMILTON

St. Joseph's Healthcare Hamilton is committed to making a difference in people's lives and creating a lasting future for the community through integrated health services and internationally recognized programs. Their threefold mission is to provide dynamic research, revolutionary methods in health sciences education, and the highest standard of clinical care in a spirit of compassion, innovation, and commitment.

- Named one of the Hamilton-Niagara's top employers
- 99% of patients would recommend to family and friends

<https://www.stjoes.ca/>





# Appendix C

## Directory of Hamilton Life Science Organizations

### Accelerators, Incubators & Financing

#### AngelONE

Angel One Network – Angel One Network is a member-based organization of investors who live, work or have strong interests in Hamilton, Burlington and other communities in Southern Ontario.



bdc supports small and medium-sized businesses in all industries and at every stage of growth with money and advice.

<https://www.bdc.ca/en>

#### EQUATION

ANGELS • ENTREPRENEURS

Equation is a platform to enable the professional and efficient operation of angel groups to benefit the angel group, the angels, and entrepreneurs seeking funding. Combining the expertise and resources of four angel groups from Southern Ontario, we accelerate the innovation ecosystem for investors and entrepreneurs.

<https://www.equationangels.com/>



Launchit Ventures is a healthcare focused venture studio with a vision to improve people's well-being through innovation. They offer a unique model that combines funding, entrepreneurship, business acumen, along with a shared business services model which reduces cost and significantly increases success rate.

<https://launchiventures.com/>



Meridian Credit Union – Meridian Credit Union is the fourth largest credit union in Canada, and the largest credit union in Ontario

#### THE FORGE

The Forge is a business incubator funded by McMaster University, serving novel and scalable startups in the Hamilton, Greater Toronto and Niagara Regions. Launched in 2015, they work hands-on with entrepreneurs to develop their business ideas from ideation and validation to growth. <https://theforge.mcmaster.ca/>



TRIO Capital Group provides the right people with the right capital to make their vision a reality. <https://www.triocapitalgroup.com/>

### Biotech & Pharmaceuticals



20120 Optimeyes Technologies are developing a transformative drug delivery platform for ocular diseases normally controlled by eye drops. Using a patent technology formulation, initially targeted for dry eye disease, they are able to change the dosing paradigm from twice daily to once or twice weekly.

<https://www.2020optimeyes.ca/>

#### ADAPSYN

Adapsyn Bioscience is a chemical bioinformatics company that discovers and develops novel bacterial metabolites for use as therapeutics.

<https://adapsyn.com/>



Adiga Life Sciences is a clinical stage company working to develop and commercialize novel therapeutic vaccines to treat a variety of allergies.

#### Affinity Biologicals

A Puritan Biotech Company

Affinity Biologicals is a primary manufacturer of more than 250 reagents and kits used in hemostasis and thrombosis research and diagnostics due to their strong background in hemostasis research with a focus on reagent development.

<https://affinitybiologicals.com/>



Algaeneers core strength is to harness micro-organisms to produce things that people care about, in gentle, sustainable, and affordable ways. Algaeneers biggest products are biopharmaceuticals, including biosimilars and biosuperiors, vaccines, and enzymes.

<http://www.algae.io/>



Allarta Life Science

Allarta Life Science is a pre-clinical life science company developing proprietary cell encapsulation technology to enable cell-based cures for chronic endocrine disorders such as Diabetes, Hemophilia and Lysosomal Storage Disorders. <https://allarta.com/>



Evolved Meats was founded by two McMaster University researchers who create cultivated meat using bioengineering techniques.

<https://www.caromeats.com/>



Celerite labs

Celerite Labs is a biotechnology spin-out from McMaster University that has developed an innovative magnetic printing technology which allows for 3D printing of cells within a few hours, without the need of any scaffolds.

<http://celeritelabs.com>



CENTURY THERAPEUTICS

Century Therapeutics develops transformative, allogeneic, iPSC-derived NK and T cell therapies to create products for the treatment of both hematological and solid tumor malignancies with significant unmet medical need.

<https://www.centurytx.com/>



Elarex Inc. is a Canadian healthcare technology company commercializing its proprietary PT120 formulation technology which has proven to stabilize biologicals (including live vaccines) so that they are as effective when stored at 40C as if they had been stored at -80C.

<http://elarexinc.com/>



EMN

Enhanced Medical Nutrition is engaged in the research, development, and distribution of evidence-based clinical nutrition in the perioperative setting. EMN supports the patient's journey through surgery with clinical nutrition to help patients prepare better and recover faster.

<https://emnhealth.com/>

### exerKINE

Exerkine Corporation is a biotechnology company developing novel therapies for the treatment of genetic and aging-associated diseases. Exerkine's focus is on developing and commercializing therapies that can materially improve the lives of patients. <http://www.exerkine.com/>



FendX's proprietary breakthrough technology, Repel Wrap, fights the spread of viruses and bacteria. When applied to high-touch surfaces, Repel Wrap repels pathogens, like COVID-19, making surfaces safer. <https://fendxtech.com/>



Forsythe Lubricants has recently stood up a hand sanitization business unit in response to COVID-19 related PPE. Forsythe manufactures both liquid and gel USP grade hand sanitizer, with production capacity of up to 1.5Mkg per month. They produce both 250 / 500ml bottles of hand sanitizers.

<https://forythelubrication.ca/>



Fusion Pharmaceuticals is a clinical stage company focused on developing novel targeted alpha therapeutics for the treatment of chemotherapy resistant cancers.

<https://fusionpharma.com/>

### MCFOCAL BIOIMAGING

McFocal Advanced Imaging develops novel optical imaging technologies that enable discovery in health and life sciences including high content screening of drug leads, precision medicine, and quantitative biotechnology.

<http://mcfocal.com/>



NANOPHYLL

NanoPhyll – NanoPhyll develops innovative nano-composite coatings for applications in the buildings, construction, medical, transportation and industrial processing industries.





# Appendix C

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Niagara Pharmaceuticals manufacturers and distributes eyewash safety supplies, including the eyewash Pur-Wash solution and the Eyewash Station Additive solution  
<http://www.niagrapharma.com/>

### NuGeneris Specialty Pharmaceuticals

NuGeneris Specialty Pharmaceuticals is a privately held subsidiary of the Centre for Probe Development and Commercialization that specializes in late-phase clinical and commercial manufacturing of therapeutic radiopharmaceuticals for international distribution.

<https://www.imagingprobes.ca/services/radiopharmaceutical-manufacturing/>



OrganoBiotech pioneers platform technologies that allow users to model complex biology with ease and without compromising experimental throughputs. They develop and sell a tissue culture platform used to grow stem cell-derived organoids with blood vessel networks to make more predictive pre-clinical models for drug discovery.

### Pharmasonica

Pharmasonica is a medical device that utilizes ultrasound to trigger drug release resulting in improved treatment efficacy, reduced side-effects, and reduced visits to a specialist. Pharmasonica provides clinicians with enhanced control over a patient's treatment while providing a significantly higher standard of care.  
<https://www.pharmasonica.com/>

### synmedix

Synmedix is a newly-founded biotechnology company created to commercialize a novel platform that dramatically enhances the effectiveness of antibiotics to address unmet medical need posed by the global health crisis in antibiotic resistance.



Synthetic Virus Technologies Inc. was founded to make effective DNA delivery a reality. Their unique technology is based on self-assembling DNA nanotechnology that brings together previously incompatible advances in non-viral smart drug delivery.

<http://spnbiotech.com/>



ToeFX's vision is to create the world's most effective foot care treatments. Their ClearToe Therapy Light is the only photodisinfection technology approved by Health Canada for the treatment of toenail fungus. It is painless, totally safe and clinically proven to clear up yellow, crumbling nails.  
<https://www.toefx.com/>



Triumvira Immunologic is an immunotherapy company with the vision of developing novel T cell therapies that are safer and more efficacious than current cancer treatments, including chimeric antigen receptor and engineered T cell receptor therapies. <https://triumvira.com/>



Turnstone Biologics – Turnstone Biologics is focused on driving innate and adaptive tumor immunity through the development of two independent, yet complementary platforms, built on a foundation of validated clinical success.

### 12 Squared Diagnostics

12 Squared Diagnostics has developed a novel test kit to measure thrombin generation at the point-of-care. This is an overall blood clotting test in which previous methods required testing to be done in a specialized laboratory. <http://12x12dx.com/>

### Contract, Professional and Other Services



Activision Laboratories Group provides analysis in the geochemical and geo-metallurgical market, material testing, agriculture, forensics, environmental, and life sciences. <https://actlabs.com/>



Acuity Insights deliver a robust academic admissions screening test for people skills.

### Affinity

The Affinity Platform enables educators to easily build dynamic online scenarios using their existing educational content. Learners can practice their knowledge acquisition, application, and critical decision-making in a simulated, web-based environment. <https://affinitylearning.ca/>



At the intersection of health, life sciences and business, Bay Area Health Trust is an example of a successful partnership between hospitals and the for-profit private sector. Bay Area Health Trust is a Hamilton, Ontario-based company that operates life science businesses and invests in growth-oriented opportunities.



Bay Area Research Logistics – Bay Area Research Logistics (BARL) is a global, clinical trial logistics organization focused on helping the global healthcare industry to successfully develop new medications and treatments.



Ballagh and Edward offers a full range of intellectual property services from filing patent and trademark applications to preparing agreements and resolving disputes.

<https://www.ballagheadward.ca/>



Bay Area Health Care Solutions – Supporting development and distribution of novel health-care initiatives



Bay Area Realty Limited – Owner, landlord, manager and liaison for Hamilton-based properties



Bay Area Records – Turn paper records into digital images for safe, secure accessible archiving.



BDO Canada has spent more than 95 years providing assurance, accounting, tax, and advisory services to a broad range of clients across the country.  
<https://www.bdo.ca/en-ca/home/>



BLAZE IP provides legal advice and services related to intellectual property protection in a manner that respects their clients and brings honor to their profession. They offer a full range of services from filing applications to preparing agreements and resolving disputes. <https://www.blaze-ip.ca/>



Brownlow Partners provides professional accounting and business advisory services to businesses and individuals across Hamilton, Halton and Niagara. Their chartered accountants bring unparalleled knowledge and experience that can help your business achieve and exceed its financial goals.

### comotion

Bringing small businesses, startup teams, like-minded entrepreneurs and professionals of all kinds together to operate their businesses under one roof. Sharing common amenities to keep overhead costs down and have a supportive community to network with and be inspired by.  
<https://www.comotiongroup.ca/>



Helping companies move from concept to creation - developing custom mold castings, match plates castings, investment castings and injection molded plastics, as well as machining with a focus on castings.

### DNA Digital

DNA Digital – Product development evaluation and translational medicine support for taking projects from drug manufacture through proof of concept and safety studies.



FERO creates disruptive, flexible, proprietary mobile infrastructure solutions at a fraction of the cost of traditional infrastructure and does so while creating jobs, saving money, innovating and helping the economy grow.  
<https://ferointl.com/>



Flyte Studios is a software development company with a skill set in creating focused educational tools. Their software, UnderstudyEdu, is being created to build a community which will allow people to discover, create, and share educational content to foster engagement and learning.  
<http://flytestudios.com/>

### FORGE & FOSTER

A dynamic, passionate, and driven investment team that manages and invests in commercial real estate. Committed to generating positive social and economic value for communities, tenants, investors, and other stakeholders through value-add initiatives in Hamilton and surrounding communities.  
<https://forgeandfoster.ca/>



# Appendix C

## Directory of Hamilton Life Science Organizations

### FYELABS™

FYELABS delivers innovation as a service. They help clients transform an idea into a selling product, very fast, and at a fraction of the cost.  
<https://fyelabs.com/>



Greening Media – Greening helps clients reach their audience in innovative and meaningful ways through new community partnerships, custom content creation, and campaign-driven marketing and media strategies.

### GOWLING WLG

As an international, sector-focused law firm with more than 1,400 legal professionals around the world, Gowling WLG is here to help you overcome your complex business challenges. Their Canadian team is made up of more than 700 legal professionals in seven cities across the country.  
<https://gowlingwlg.com/en/offices/canada/hamilton/>

### hrimp

Hamilton Regional Laboratory Medicine Program (HRLMP) – Hamilton Regional Laboratory Medicine Program is one of the largest integrated laboratory service programs in Canada. Providing laboratory support and clinical testing for clinical trials and research studies in the Hamilton area.



HT Consulting has been offering complete solutions for Blind and Visually Impaired computer users for over 15 years. They provide assistive technology for people with visual impairments as well as those with educational and developmental disabilities.  
<http://htconsulting.ca/>



The Hamilton Technology Centre is a private innovation hub. It is a modern 40,000 square foot, fibre optic equipped facility that is currently striving to foster the development of technology companies by providing space and community to new and accelerating companies who choose the Hamilton area as their home.  
<http://hamiltontechnologycentre.ca/>

### infinotype

Infinotype provides custom bioinformatic solutions for health technology companies – tailored to the specific end-user needs of each client. They help companies realize the most from their data, with a broad range of advice and services.

<https://infinotype.com/>

### INO

INO is the largest centre of expertise in optics and photonics in Canada and is among the best technological research centres in the world. Through multiple light applications, from laser and fibre optics technologies to imaging systems, INO controls light to capture, identify, predict, decide or transform the real world.  
<https://www.ino.ca/en/>

### LINAMAR

Linamar is an advanced manufacturing company where the intersection of leading edge technology and deep manufacturing expertise is creating solutions that power vehicles, motion, work and lives for the future.  
<https://www.linamar.com/>

### MALLEUM

Malleum Partners – Malleum Partners is a private equity firm that grows capital through active, value-add real estate investing



McArthur Medical Sales Inc. represents manufacturers from Canada, United States, England and Europe. Through their four business units, they proudly offer innovative, cost effective and high-quality products, prompt service and informed advice.  
<https://mcarthurmedical.com/>



KPMG (Hamilton) – At KPMG, we work to provide you with the one-on-one personalized audit, tax and advisory service you desire.



McMaster Genomics Facility – McMaster Genomics Facility offers next generation sequencing and DNA synthesis service



Solving laboratory challenges is at the core of what MERQ does. Lab equipment design and automation is their primary focus but they also support with custom tooling, fixtures, repairs, service, floor plans, building design and process improvement.  
<https://merqautomation.com/>

### OmniaBio

OmniaBio Inc., a subsidiary of Toronto-based CCRM, is a contract development and manufacturing organization (CDMO) producing gene-modified cells and viral vectors, compliant with current Good Manufacturing Practices (cGMP) standards.  
<https://www.omniabio.com>



Operatic Agency – Operatic helps companies create amazing apps and websites, working with startups as well as some of the Ontario's largest companies to build products that are intelligent, attractive, and user-friendly.



Paramount Safety Consulting Inc. is dedicated to the creation of a healthy and safe work environment for all their valued clients in Ontario.

<https://paramountsafetyconsulting.com/>



The Research & High-Performance Computing Service at McMaster University supports the computational and digital research infrastructure needs of researchers from all disciplines across campus.

<https://research.mcmaster.ca/research-resources/local-it/rhpcs/>

### Q-RESERVE

QReserve helps schedule thousands of meeting rooms, laboratories, office spaces, hot desks, equipment, and people every day. QReserve was built for the laboratory and all of its complex scheduling and workflow requirements. Schedule equipment, manage projects and service requests, and invoice from one application.

<https://get.qreserve.com/>



Thrive Group is a non-profit, charitable organization that acts as the umbrella organization for charities with a healthcare focus by sharing best practices and back office resources. Thrive Group organizations include AbleLiving Services, Capability Support Services, Idlewyld Manor and St. Peter's Residence at Chedoke.

<https://www.thrivegroup.ca/>



Webility Solutions is a web development company dedicated to building high quality custom web and mobile applications. Since 2007, their team of experienced software developers have designed applications to improve operations, mitigate risk and cut unnecessary costs for their customers.  
<https://webility.ca/>



Weever Apps – Digital tools to support manufacturing operational excellence



Westinghouse HQ offers over 40,000 square feet of space for unique retail and office opportunities. Westinghouse has been synonymous with industrial and corporate excellence in Hamilton, be part of the tradition by selecting Westinghouse HQ for your business.

<https://www.westinghousehq.com/>



Whitebird is a leading distributor and manufacturer of packaging, sanitation and safety supplies, including respiratory and eye-safety personal protective equipment. They also manufacture their own line of disposable clear polyethylene film face shields that provide personal protection to the face from airborne particles.

<https://whitebird.ca/>



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Yordas is a leading international provider of scientific and technical services, regulatory advice, sustainability services and training to industry in the fields of chemicals management and risk assessment. They deliver innovative solutions for business, industry and government across a broad range of industries.

<https://www.yordasgroup.com/>

### Digital Health / e-Health



AgeRate allows for the control of ageing by monitoring biological age and adopting new lifestyle interventions provided through their platform.

<https://www.age-rate.com/>



AI Endurance is a software application that provides affordable guidance on how to reach performance goals for endurance athletes (runners, cyclists, and triathletes). Endurance athletes struggle to select the 'right' training plan for their individual goals. AI Endurance utilizes the athletes' training data to provide automatized individualized training and predict performance.

<https://aiendurance.com/>



AI-Innovate – AI-Innovate is a leader in custom machine learning solutions to help doctors produce more accurate patient diagnoses, predict future health and recommend personalized treatments.



Arya Electronic Health Records is a multidisciplinary, cost-effective platform for your medical office. Their philosophy is to build technology for physicians that is beautiful, intuitive, easy to use, saves them from headaches and saves them money.

<https://www.aryaehr.com/>



Blucos is a Startup database and map-based website/app that allows users to easily find carbohydrate data for any menu item at any restaurant that is searched. Users are also able to rate and evaluate restaurants based on their nutrition data that our team has been able to extract.



Cyno is a virtual healthcare platform that connects providers and clients. Clients search for and book providers on the Cyno marketplace, and providers fulfill services using Cyno's secure and encrypted video, messaging, and document-sharing interface.

<https://cyno.ca/>



Design2Health are medical applications specialists who elevate innovation into direct implementation within the health care sector.

<http://design2health.com/>



EmergConnect – EmergConnect is leading the way in revolutionizing emergency care by empowering patients and giving clinicians the power of data.



The goget.fit App connects health & fitness professionals with their clients to help them get fit. The goget.fit trainee app is based on research studies by leading universities and every detail is designed to create positive behavioural change for the user.

<https://www.goget.fit/>



Helpers – Helpers is the Uber of home care with a technology platform that helps seniors and families request home care services on demand from a trusted network of caregivers.



InputHealth facilitates outcomes-based health care delivery at the point of care through a cloud-based platform. InputHealth has developed a comprehensive cloud based health platform referred to as the Collaborative Health Record which facilitates outcome driven interactions between healthcare providers and patients.

<https://inputhealth.com/>



iUGO Health – With innovative technology, iUGO Health is creating solutions that bring healthcare to home and community settings; improving health outcomes for patients and driving efficiency for providers.



Lumedi's cloud based platform enables medical researchers to collect high quality data from anywhere. As a collaborative solution, it connects research teams, clinicians and study participants in a way that improves patient outcomes.

<https://lumedi.org/>



Lunar Medical is solving the challenges of providing medical support in spaceflight. They are committed to bringing the benefits of spaceflight medical solutions to people everywhere, and believe in a future where the best medical care is available to everyone, everywhere, any time.

<https://www.lunarmedical.com/>



Marrow is using advanced technologies to advance blood cancer pathology. They create deep learning representations of cancer that uncover more profound insights than ever before.

<https://marrow.ca/>



MedStack is a cloud hosting platform for healthcare applications that significantly reduces the time and cost to develop solutions by building in privacy compliance and an integration-ready data model, prioritizing developer flexibility and ease of use without compromising best-in-class security.

<https://medstack.co/>



MedTel Software Ltd. is committed to providing efficient, cost saving billing and medical software solutions at a reasonable price. MedTel Software Ltd. also provides the same quality with integrated medical information products that target specialty physicians and clinics.

<https://www.medtel.on.ca/#/landing>



My Well Self is a holistic healthcare marketplace where consumers research holistic treatments via user generated data to connect with local and vetted holistic health practitioners.

<https://www.mywellself.ca/>



NeuralSeg have developed a deep learning algorithm that quickly and automatically segments medical images. They are currently developing a web-platform that harnesses the power of this algorithm, allowing users to store and segment medical images.

<https://neuralseg.com/>



NexMED Technologies offers an extensive range of products from PPE to customized apparatuses and appliances to aid Doctors and front-line healthcare workers to do their job effectively and safely.

<https://www.nexmed.ca/>



Pairwise Affinity's current focus is the development of innovative vision testing systems for research and clinical applications, optimized for measuring changes in visual function in patients with specific visual disorders, such as Age-Related Macular Degeneration and Diabetic Retinopathy.



Parapixel Diagnostics – Parapixel Diagnostics is designing practical digital pathology workflow support tools with an interdisciplinary team of pathologists, engineers, and computer scientists.



Predict Technologies would like to introduce Patient Health Integrated Electronic Records. Their solution will leverage patient-inputted medical history and best practice care processes in delivering a platform to reduce patient intake time, decrease charting time and incentivize post-visit discharge compliance.

<https://www.phri.ca/>



Reliq Health Technologies is a rapidly growing technology company focused on developing innovative remote patient monitoring, care collaboration and telemedicine solutions for community-based healthcare. Their virtual care platform uses a high tech, low touch approach to provide high-quality healthcare in the community setting.

<https://www.reliqhealth.com/>



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### ROME

ROME is suite of powerful logistics tools to manage your clinical trial study's inventory, keep track of orders and shipments, and automatically resupply drug.



SanteSuite Inc. (SSI) is one of the world's most experienced teams in global digital health systems research, development and implementation around the globe. SSI was founded with a clear reason for being, which is to enable the best health for all citizens of the world using digital technologies.

<https://santesuite.com/>

### SmartAMI

SmartAMI simplifies complex solutions so you can deploy very complex designs in the cloud within minutes instead of hours and days; scale and utilize better.



WeCare(MD) – Leveraging emerging technology to deliver timely health care to Canadians that meets, and often exceeds, traditional standards of care.

### zentrela

Zentrela's neurotechnology platform is the first scientifically proven test to objectively quantify cannabis psychoactive effects. They are building the world's largest database of cannabis product effect information to fuel the growth of the cannabis industry.

<https://zentrela.com/>

### Government and Non-Profits



Home Care Ontario is a member-based organization representing providers of quality home care services from across Ontario. Association members represent an estimated 28,000 staff collectively serving 350,000 Ontarians per year.

<https://www.homecareontario.ca/>



The National Research Council of Canada (NRC) is Canada's largest federal research and development organization. The NRC partners with Canadian industry to take research impacts from the lab to the marketplace, where people can experience the benefits.



Next Generation Manufacturing Canada

Next Generation Manufacturing Canada is a non-profit organization leading Canada's Advanced Manufacturing Supercluster. By combining Canada's manufacturing and technology strengths, and facilitating access to supporting infrastructure and services, they aim to achieve exponential benefits for the Canadian economy

<https://www.ngen.ca/>



The Ontario Centre of Innovation (OCI) builds bridges between sectors, sparking vibrant collaborations, leading to the creation of products and jobs that make a real impact in the lives of Ontarians — now and into the future. OCI helps ensure Ontario is where the next happens. We accelerate job creation through innovation, commercializing game-changing research by connecting industry and academia.

<https://www.oci-innovation.ca/>



The Ontario Association of Medical Radiation Sciences is a provincial professional association representing the Medical Radiation Sciences profession in Ontario. They are the recognized advocate and voice for Medical Radiation Technologists and Diagnostic Medical Sonographers across the province.

<https://www.oamrs.org/Apps/Pages/home>



The Scleroderma Society of Ontario, a registered charity, was officially established in 2007 and is committed to promoting increased public awareness, advancing patient wellness and supporting research in Ontario's scleroderma community.

<https://www.sclerodermaontario.ca/>

### Hospitals and Care Providers



The Firestone Institute for Respiratory Health is a world class respiratory program providing comprehensive patient care, research and education. The program is comprised of an outpatient service, an inpatient unit managing severe or chronic respiratory diseases and the regional thoracic (chest) surgery program.

<https://healthsci.mcmaster.ca/firh>

### St. Joseph's

Healthcare Hamilton

The Biostatistics Unit at St. Joseph's Healthcare provides comprehensive, flexible and timely statistical support tailored to the ongoing needs of researchers affiliated with the Research Institute of St. Joe's Hamilton and at the Faculty of Health Sciences at McMaster University.

<https://research.stjoes.ca/research-administration/biostatistics-unit>



Hamilton General Hospital – Founded in 1848 as the first hospital in Hamilton, Hamilton General Hospital is a leading healthcare provider for the entire South Central Ontario region.



The mandate of the Hamilton Integrated Research Ethics Board is to safeguard the rights, safety and well-being of all research participants. All research projects involving McMaster University, St. Joseph's Healthcare Hamilton and Hamilton Health Sciences personnel, must obtain ethical approval from HIREB.

<https://hireb.ca/>



Juravinski Hospital – Juravinski Hospital provides acute inpatient and palliative care, diagnostic services and an educational environment to support the needs of cancer patients and the Juravinski Cancer Centre.



McMaster Children's Hospital – Providing care to children from across the region since 1988



Marchese Health Care is an independent community-based health care provider dedicated to the delivery of compassionate, client-focused care. Providing a wide variety of medication, supplies and equipment; clinical knowledge; and specialized services to meet your health and wellness needs.

<https://marchesehealthcare.ca/>



Hamilton Health Sciences Foundation – We raise funds and manage donor gifts to support outstanding clinical care and research for the communities served by Hamilton Health Sciences.

### St. Joseph's

Healthcare Hamilton

St. Joseph's Healthcare Foundation works to raise and steward funds to support exemplary patient care, research and education at St. Joseph's Healthcare Hamilton and in the communities they are honoured to serve.

<https://www.stjoesfoundation.ca/>

### St. Joseph's

Healthcare Hamilton

Since 1921 St. Joseph's Home Care has provided high quality, values-based home and community services in a spirit of compassion and dedication. They have evolved from a nursing agency to offering a much broader range of services, and their steadfast commitment to delivering exemplary client-focused care to Hamilton continues.

<https://www.stjosephshomecare.ca/>

### St. Joseph's

Healthcare Hamilton

St. Joseph's Villa is one of Ontario's largest and most innovative long-term care homes. Located in historic downtown Dundas, they are proud to be the second largest organization in the St. Joseph's Health System, continuing the mission and legacy of the Sisters of St. Joseph of Hamilton.

<https://sjv.on.ca/>



St. Peter's Hospital – St. Peter's provides inpatient, outpatient, and community-based programs and services that focus on four pillars of excellence: Dementia, Aging, Palliative Care and Rehabilitation.





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Valued Connections Healthcare is a Direct to Patient Care Management and Service Navigation Firm. For families with aging loved ones who fear their family members are not getting the care they deserve and are frustrated trying to manage complex and disconnected healthcare systems for their loved ones, Valued Connections is Ontario's only full-service integrated case management provider. <https://valued-connections.ca/>



West Lincoln Memorial Hospital – With a unique focus on integrating primary care, West Lincoln serves as a point of access to one of the largest health systems in Canada

### Medical Device & Diagnostics



AIMA Labs is a Canadian, pre-clinical FemTech Biotechnology company co-founded by two scientists who have dedicated their professional lives to researching reproductive endocrinology and infertility. Our goal is to develop new products to fill current gaps in women's health.



Blake Medical Group Inc. has over 15 years experience in medical manufacturing, medical service providing and advanced wound care. They create products that prevent injury from untreated wounds, pressure ulcers/sores or prolonged periods of vibration and multiple shocks/impact. <https://blakemedicalgroup.com/>



Blue Orchid was founded based on a simple mission to create and design simple and innovative solutions for challenges millions of caregivers face every day. They create and develop assistive living products aimed towards increasing the quality of life for both patients and caregivers. <https://www.blueorchidcare.com/>



Epineuron Technologies is a medical device company developing tomorrow's gold standard of care for damaged or impaired nerves by developing a set of devices for intra- and post-operative use that supercharges neurons and the regenerative process. <http://epineuronotech.com/>



eye3 is developing and commercializing a next generation drug screening platform which delivers clinical results on a field deployable hand held platform. The eye3 solution allows for enhanced and superior flexibility and accuracy over that which is commercially available in the market today.



Flinn Scientific Canada was born from a desire to serve science teachers and has since grown to become a trusted source for science supplies and equipment, laboratory chemicals, and lab safety resources. <https://www.flinnsci.ca/>



### FluidAI

FluidAI allows for real-time monitoring of anastomotic leaks with Origin, by FluidAI, which may allow surgeons to detect leaks an average of 1.6 days sooner than the standard of care. <https://fluidai.md/>



GeneBlueprint – Gene Blueprint uses a combination of the client's DNA, proprietary algorithm, patented gene scores and relevant lifestyle data to make evidence-based recommendations on the type of nutrition and exercise strategies that are most likely to be effective.



The Genesis Pain Relief Light is an effective medical device that alleviates pain and stimulates healing at the cell level by concentrating broad spectrum light through an innovative water-based filter.

<https://genesishhealthlight.com/>



Healthcare Innovation in Neuro Technology is developing a wearable point-of-care monitoring device that detects when patients at high-risk are having a stroke. The device is a comfortable, wearable headband that will alert patients, care-givers, and emergency services in the case of a stroke. <https://www.hintneuro.com/>



Hemostasis Reference Laboratory is a Canadian Laboratory with over 25 years of experience in providing quality coagulation testing services to customers internationally. They specialize in esoteric coagulation testing and custom assays with specific reagent/instrument combinations.



Hyivy Health creates a pelvic rehabilitation device with trackable data for women who have pelvic cancers and diseases to help alleviate pelvic health symptoms after a devastating diagnosis, treatment or surgery. <https://hyivy.com/>



Imaginable Solutions creates assistive devices for people living with impaired motor function to improve their quality of life during everyday activities. <https://www.imaginablesolutions.ca/>



Live Easy is an action orientated company that connects the dots between companies and consumers. Having 30 years of real-life accessibility challenges and a wealth of product knowledge means they can navigate almost any challenge that accessibility or Aging in Place can present. <https://liveeasyinc.com/>

### MaCough

MaCough is aiming to create a quantitative way for clinicians to be able to efficiently diagnose, assess and monitor cough. Chronic cough is a persistent daily cough that lasts greater than eight weeks and affects 10% of the general population. In clinical practice, there are very limited tools in order to quantitatively monitor cough.



Mariner Endosurgery Inc. develops and commercializes innovative computer assisted medical devices for future-facing laparoscopic surgeries. LaparoGuard, is a novel soft-tissue surgical navigation platform that augments visualization during laparoscopic surgeries, enhancing the surgery's safety profile. <http://marinerendosurgery.com/>



McMaster HealthLabs – Curbing the cost of COVID-19 through research initiatives & testing solutions.

### Medbotics

Insight Medbotics has clinically tested an MRI-guided robotic device that positions a biopsy device with unprecedented precision and patient comfort, and is now moving to commercialization clearances for both Canada and the USA. <https://insightmedbotics.com/>



m-Health Solutions provides innovative heart monitoring technologies and cloud-based reporting services throughout Canada. Their evidence-based offerings focus on improving the patient monitoring experience while supplying better connected care which reduces wait times. <https://m-healthsolutions.com/>

### nada

Nada – the new way to brush your teeth. Unlike disposables, Nada's beautiful metal handle doesn't roll over, collect germs or end up in a landfill. It's the new way to be eco-friendly, twice a day. For every Nada toothbrush sold, the company will donate \$1 to a charitable organization. <https://trynada.com/>



OgenaSolutions focuses on the important and integral connections among human, animal, and environmental health. They offer innovative, state-of-the-art products and technologies that meet the highest standards for efficacy, efficiency, and safety. <https://ogenasolutions.com/>



Prova Innovations are passionately driven to develop new technologies to aid children with mobility challenges. They are a start-up medical technology company who is focused on creating a suite of at-home therapeutic products for children suffering from neurological conditions, such as cerebral palsy, brain and spinal cord injuries. <https://provainnovations.com/>



PULSE Lifesaving is a full-service training provider of lifesaving, first-aid, and lifeguard training. They host certification training programs for individuals, groups, and corporate clients. All programs are fully accredited by WSIB and the Royal Lifesaving Society. <https://www.pulselifesaving.com/>



# Appendix C

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PulseAlert provides personal emergency response systems for seniors. They are passionate about providing patients with a service that not only keeps them safe, but gives back to the community that they call home. For every 200 sales, Pulse aims to employ one veteran.

<https://www.pulsealert.ca/medical-alert-systems>



Senso Minds is dedicated to designing & developing high-quality Oral Motor Toys for Toddlers & Children alike. From soothing toddlers with teething pain to satisfying children's sensory needs, they are dedicated to innovating & designing new oral toys for children, at every stage of development.

<https://sensominds.com/>



Sound Options is an award-winning company that provides affordable tinnitus treatments that have been clinically tested to help people manage their tinnitus. They provide a tinnitus treatment that is customized for your unique hearing & tinnitus profile.

<https://soundoptions.ca/>



Stryker is one of the world's leading medical technology companies and, together with their customers, are driven to make healthcare better. Stryker offers innovative products and services in Orthopaedics, Medical and Surgical, and Neurotechnology and Spine that help improve patient and hospital outcomes.

<https://www.stryker.com/ca/en/>



TBI Finder is a health tech company that provides personalized assessments for brain injury patients. They use Big Data analytics to identify the presence, severity, and location of a concussion, meaning that no baseline scan is required. The result is that Physicians can link injured brain areas with clinical patient symptoms.

<https://www.tbifinder.com/>



Tenomix's mission is to develop novel technologies that target inefficiencies in the pathology workflow; thus enabling clinicians to make better-informed treatment decisions and provide the highest standard of patient care while reducing overall costs for healthcare systems.



TSS Medical – TSS brings innovative products and cost savings to our healthcare system, with a specialization in reconditioned hospital equipment for the Canadian market.



VoxNeuro provides the world's first objective brain health assessment that goes beyond a diagnosis. They deliver quantitative insights on brain function to assess performance, inform treatment and track brain health with unprecedented precision.

<https://voxneuro.com/>

### Research Centres and Institutes



Additive Manufacturing Innovation Centre (AMIC) – A leading research centre in metal additive manufacturing, the Additive Manufacturing Innovation Centre (AMIC) provides designers and manufacturers with a collaborative applied research environment.



The Allergy, Genes and Environment Network, is a not-for-profit organization hosted at McMaster University in Hamilton, ON, that promotes the work of Canadian researchers and organizations dedicated to improving the quality of life of people suffering from allergic and related immune diseases.

<https://www.allergen.ca/>



The Biointerfaces Institute at McMaster University is a state-of-the-art facility designed to use high-throughput methods to provide a new understanding of the nature of the biological material interface, or biointerface.

<https://biointerfaces.mcmaster.ca/>



The Brain-Body Institute is focused on understanding the structural and physiological links between the brain and nervous system and bodily functions in health and disease.

<http://www.brain-body.ca/>



Housed within the School of Rehabilitation Science at McMaster University, CanChild is the hub of an academic network of international scientists who conduct applied clinical and health services research. CanChild research efforts focus on children and youth with disabilities and their families.

<https://www.canchild.ca/>



The Centre for Advanced Light Microscopy (CALM) is a state-of-the-art facility that fosters academic and industrial partnerships through enhanced access to established cutting-edge light microscopy, photopatterning, and light-assisted 3D printing techniques.

<https://calm.mcmaster.ca/>



The Canadian Centre for Electron Microscopy provides world-class electron microscopy capabilities and expertise to Canadian researchers and industry working in a broad range of fields.

<https://ccem.mcmaster.ca/>



The Centre for Health Economics and Policy Access is a world-class interdisciplinary health research centre that fosters excellence in acquiring, producing and communicating socially-relevant knowledge in the fields of health economics and health policy analysis to inform fair and sustainable health and social systems.

<https://chepa.mcmaster.ca/>



The Canadian Research Data Centre Network is a partnership between a consortium of Canadian universities and Statistics Canada, through its Research Data Centre Program, to provide university, government and other approved researchers ready access to a vast array of social, economic and health confidential microdata.

<https://crdcn.org/>



The Centre for Medicinal Cannabis Research is a partnership between several key institutes and centres in the Hamilton region that leverages McMaster University's world-renowned expertise in health research and evidence-based medicine to create a hub for evidence-based data and innovative research.

<https://cannabisresearch.mcmaster.ca/>



The Centre for Microbial Chemical Biology provides easy access to expertise and equipment necessary for chemical biology research. The Centre features six core labs that enable chemical biology research to be conducted in one central location.

<https://iidr.mcmaster.ca/cmcb/>



The Centre for Minimal Access Surgery is a McMaster University Centre located in St. Joseph's Healthcare Hamilton. The Centre provides state of the art facilities, education and training in minimally invasive procedures for surgeons and nurses.

<https://www.cmas.ca/>



The Centre for Probe Development and Commercialization is one of a very few R&D centres that has the full range of scientific, technical, regulatory and business expertise combined with the full specialized infrastructure required to translate radiopharmaceuticals to the clinic and provide them to the commercial marketplace.

<https://www.imagingprobes.ca/>



The Centre for Surgical Invention and Innovation is a National Centre of Excellence research accelerator committed to enhancing the quality and access to healthcare for all Canadians through developing and commercializing innovative medical robotic technologies and novel techniques.

<https://www.csii.ca/>





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The Centre of Excellence in Protective Equipment and Materials will assist research and development needs for Canadian companies, both existing and new, so that they can meet today's needs for Canada but also develop the next generation of personnel protective equipment to become global leaders in the future.

<https://www.eng.mcmaster.ca/centre-excellence-protective-equipment-and-materials-cepm>



CLARITY represents the formal alliance of a group of researchers who have enjoyed a long-standing and fruitful collaboration. Through formal collaboration, Clarity's clinical advances through research and information translation has been pivotal in creating a renewed sense of spirit, vision and commitment.

<http://www.clarityresearch.ca/>



The Clinical Research Laboratory and Biobank was established in 1987 to provide scientific, analytical, and Biobank support for large multinational clinical trials and epidemiologic studies.

<https://www.crlblab.ca/>



Researchers at the David Bralay Centre for Antibiotic Discovery are equipped to lead in international efforts against antimicrobial resistance through building on McMaster University's strengths, resources, and partnerships.

<https://www.mcmaster-dbcad.com/>



Escarpment Cancer Research Institute brings together well-established and successful cancer research groups, as well as emerging groups, from McMaster University, Hamilton Health Sciences, and the Juravinski Cancer Centre.

<https://ecri.mcmaster.ca/>



The Farncombe Family Digestive Health Research Institute is an integrated group of clinical and basic scientists dedicated to understanding the impact of digestive health and nutrition on disease across the life span.

<https://farncombe.mcmaster.ca/>



The Farncombe Family Gnotobiotic Facility, located in McMaster University, is Canada's only gnotobiotic, or germ free, research facility for gastrointestinal disease and other research including immunology and microbiology.

<https://farncombe.mcmaster.ca/research/facilities>



The GMEL at McMaster provides high-quality, affordable, cutting-edge genomics services. Our labs are equipped with the latest technology to perform a range of experiments, including next generation sequencing, microarray analysis, and bioinformatics.

<https://fhs.mcmaster.ca/pgp/facilities.htm?tab=1>



The Firestone Institute for Respiratory Health is a world class respiratory program providing comprehensive patient care, research and education. The program is comprised of an outpatient service, an inpatient unit managing severe or chronic respiratory diseases and the regional thoracic (chest) surgery program.

<https://healthsci.mcmaster.ca/firh>



The Geriatric Education and Research in Aging Sciences Centre is at the forefront of several innovative research initiatives focused on maximizing the resilience of vulnerable older adults. Their mission is to make life better for older adults by bringing the best research to the frontlines of care as quickly as possible.

<https://www.gerascentre.ca/>



The Gilbrea Centre is an interdisciplinary research hub that is dedicated to address issues of aging through collaborative and policy relevant research.

<https://gilbrea.mcmaster.ca/>



Health Information Technology Services is an information technology consulting and hosting service provided by the Information & Communication Technologies team at Hamilton Health Sciences who serves healthcare organizations in the region.

<https://www.hits-it.ca/>



The Hamilton Centre for Kidney Research brings clinical and biomedical researchers together in one place where the focus is to improve the lives of patients with chronic kidney disease through leading-edge research.

<https://hamiltonkidneyresearch.ca/>



The Hamilton Medical Research Group delivers a unique partnership in drug development and commercialization through working with their partners in development and introduction of safe and effective medicines that improve lives of Canadians.

<http://hmrg.org/>



The Health Information Research Unit is dedicated to the generation of new knowledge in the nature of health and clinical information problems, the development of new resources to support evidence-based health care, and the evaluation of various innovations in overcoming health care information problems.

<https://www.mcmasterhkr.com/>



The Health Leadership Academy strives to have a transformative impact on global healthcare by nurturing a community of future leaders. They proudly support collaboration and showcase new projects and pedagogy in health innovation within the McMaster community and surrounding area.

<https://healthleadershipacademy.ca/>



IDEAWORKS – IDEAWORKS is Mohawk College's applied research and innovation department. IDEAWORKS fills the space between research and solutions by delivering customized support to organizations.



LIVE (Large Interactive Virtual Environment) Lab is a unique 106-seat Research Performance Hall designed to investigate the experience of music, dance, multimedia presentations, and human interaction.



Researchers at the McMaster Child Health Research Institute are looking beyond medical treatments of individual conditions to explore the deeper connections between childhood illness and long-term health.



McMaster Digital Transformation Research Centre – MDTRC engages in cutting-edge multi-disciplinary research to understand how digital technology is impacting individuals at the physical and neurological level, as well as transforming organizations and society at large.



McMaster Immunology Research Centre – Exploring fundamental and translational research in immunology to forge new treatments



McMaster Industry Liaison Office – Supports research and commercialization endeavors of McMaster University



The McMaster Institute for Research on Aging was created to stimulate and facilitate interdisciplinary research in aging, as well as to develop innovative educational programs for students within the academic and clinical realms.

<https://mira.mcmaster.ca/>



McMaster Manufacturing Research Institute – MMRI is one of Canada's most advanced and best-equipped research laboratories, combining research excellence with state-of-the-art equipment to meet the sophisticated research and development needs of leading manufacturers.



McMaster Nuclear Reactor – The first university-based research reactor in the British Commonwealth, serving a core group of researchers exploring the smallest structures of matter, developing new probes for medical diagnostics and studying radiation safety.



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The Medical Imaging Informatics Research Centre at McMaster is a cross-over program between the Faculty of Health Sciences and Engineering that brings together radiologists and engineers in order to bridge the gap between clinical studies and computer sciences and to solve specific issues in Medical Imaging.  
<http://www.miircam.ca/>



Mitacs is a national, not-for-profit organization that has designed and delivered research and training programs in Canada for 20 years. Working with 70 universities, 6,000 companies, and both federal and provincial governments, they build partnerships that support industrial and social innovation in Canada.

<https://www.mitacs.ca/en>



Medical Technologies Innovation Centre – MTIC provides an interactive collaborative space for research and innovation.



The mHealth and eHealth Development and Innovation Centre at Mohawk College conducts digital health applied research, provides advanced skill development services, and leads the design, development and testing of electronic medical records systems, patient health records systems, clinical assessment tools, and patient-facing mobile and web application development and device integration.

<https://www.mohawkcollege.ca/ideaworks/mhealth-ehealth-development-and-innovation-centre-medic>



Mohawk's Sensor Systems and Internet of Things Lab helps Canadian companies become more effective in their adoption of IoT for industrial use.



The Michael G. DeGroot Institute for Infectious Disease Research at McMaster University is a world-leading centre of transdisciplinary infectious disease research. Since its inception, the IIDR has brought together a successful team of over 30 principal investigators and 2000 trainees.  
<https://iidr.mcmaster.ca/>



The Michael G. DeGroot Institute for Pain Research and Care encompasses an array of technologies, disciplines, and specialties to explore the causes of a number of different types of pain, develop new strategies for its prevention, diagnosis and management, and innovative care for patients.  
<https://healthsci.mcmaster.ca/pain-institute>



Michael G. DeGroot National Pain Centre – Developing clinical practice guidelines for the treatment of chronic pain



Ontario Tumour Bank – Ontario's leading biorepository of tumour and blood samples



The Population Health Research Institute (PHRI) is Canada's premiere global health research institute and a world leader in large clinical trials and population studies. Through international collaboration and innovation, PHRI explores CVD, diabetes, kidney and lung diseases, brain health, cancer and more.  
<https://www.phri.ca/>



The Offord Centre for Child Studies, through collaboration across fields such as child psychiatry, psychology, epidemiology, paediatrics, policy development, social work, and nursing, aims to better understand children's mental health problems with the overall goal of improving the lives of children and youth.  
<https://offordcentre.com/>



Redeemer University is a private Christian liberal arts and science university located in Hamilton. Redeemer stands in the Reformed Tradition and offers Bachelor of Arts, Bachelor of Education, and Bachelor of Science degrees.  
<https://www.redeemer.ca/>



Sheardown Lab – The Sheardown Lab is working on the next-generation of contact lenses capable of delivering drug effectively to the front of the eye to treat anterior ocular conditions.



The Global Nexus for Pandemics and Biological Threats leverages our collective strength and international networks, building an environment for the world's top experts across disciplines and sectors to work together.



The Mayer Institute – The Mayer Institute delivers world-class, evidence based diabetic foot wound care and education.



The Robert E. Fitzhenry Vector Laboratory is committed to supporting translational medicine by providing virus-vector manufacturing services to researchers who want to move forward to clinical trial testing of their product.



The Research Institute of St. Joe's Hamilton – Coordinating research activities across at St. Joseph's Healthcare, Hamilton



Thrombosis & Atherosclerosis Research Institute – TaARI is focused on researching diagnostics and treatment of thrombosis and vascular disease

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