MISSISSAUGA

LIFE SCIENCES CLUSTER STRATEGY

2017-2021

MISSISSAUGA

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MESSAGE FROM THE MAYOR

I am excited to share with you the Mississauga Life Sciences Cluster Strategy, the first of its kind in Canada for a municipality. The Strategy was created through the collaborative efforts of the City of Mississauga, our partners and our life sciences sector leaders. The demonstration of commitment and enthusiasm towards a shared vision and goals, is what makes this Strategy meaningful and purposeful to a larger ecosystem that supports Mississauga's life sciences cluster.

The research and engagement completed for this Strategy made it clear that Mississauga has all the ingredients to build and grow our sector and attract a highly skilled and talented labour force. This Strategy also outlines the importance of political support in growing our regional life sciences cluster to become the next global leader in life sciences.

According to Life Sciences Ontario (LSO), the economic impact of Ontario's life sciences sector is substantial, drawing in $21.6B in GDP and $448M in income tax a year. As Mississauga is the second largest life sciences cluster in Canada by employment, with 430 companies employing over 22,000 people, this sector is a significant contributor to our city's economic health and well-being.

Moving forward, this Strategy will guide the Economic Development Office through the next five years on addressing gaps and opportunities that will leverage our existing strengths in the sector, and seek out logical areas for strengthened partnerships and collaboration. This Strategy is the spark that will ignite the synergy between government, industry and academia. Together, we will create a sustainable environment that supports and nurtures scientific breakthroughs and medical innovations that will benefit the world.

Bonnie Crombie

Mayor Bonnie Crombie
City of Mississauga

INTRODUCTION

University of Toronto, Mississauga Campus

INTRODUCTION

STRATEGY BACKGROUND & PURPOSE

The City of Mississauga Economic Development Office (EDO), in consultation with key stakeholders, has undertaken the development of the Mississauga Life Sciences Cluster Strategy ("Strategy"). This report is a comprehensive municipal document, cluster strategy and implementation plan identifying short, medium and long-term priorities over a five-year period – 2017 to 2021 – to support the growth and development of the local life sciences cluster.

The City of Mississauga Economic Development Strategy (2010) identified four key knowledge-based sectors to foster economic growth and prosperity: life sciences, advanced manufacturing[1], information and communications technology (ICT) and financial services. While the life sciences sector has experienced considerable historic momentum, the City of Mississauga Economic Development Strategy identified the need to capitalize on existing assets and initiatives in order to strengthen the sector.

Economic Development Strategy - Goal 1: Become a Global Business Magnet

Objective 1: Target Opportunities in High Growth Sectors

1.3: Capitalize on the ongoing efforts of the Biotech Initiative and Research Innovation Commercialization Centre (RICC) to sustain an ongoing dialogue among leaders in academia, industry and healthcare organizations and build a cohesive life sciences community in the City.

The life sciences sector remains Mississauga's second most competitive key sector, following aerospace[2]. A review of Mississauga's relative life sciences employment highlights a large competitive advantage for both 2003 and 2014. However, Mississauga's competitiveness has declined over the years due to increasing competition from other jurisdictions.

Life sciences is the science of all living organisms. Life sciences companies use technology to deliver commercially-viable products and services and those that directly support these activities along the entire commercial value chain[3]

This Strategy marks the beginning of a new era for Mississauga's life sciences cluster – developing a shared cluster vision amongst stakeholders with purposeful and collaborative actions designed to grow and strengthen the cluster on the national and international stage. The Strategy is ultimately intended to:

- Serve as a building block to position Mississauga as a leading life sciences cluster;
- Address ways to enhance Mississauga's innovation economy and innovation support systems for the life sciences cluster; and
- Be used as a tool to support other innovation approaches and align with the Province's cluster development approach.

1 To include aerospace, food and beverage, automotive and cleantech.
2 As benchmarked by Ontario's life sciences employment.
3 Life Sciences Ontario Sector Report, 2015

Sheridan Institute of Technology and Advanced Learning

Hazel McCallion Campus

INTRODUCTION

MISSISSAUGA'S LIFE SCIENCES CLUSTER

The origins of Mississauga's life sciences cluster started in 1961 when a company called Astra Pharma opened a manufacturing facility in the rolling fields of what was to become the City of Mississauga. In the following years the availability of land, the convenient road infrastructure, close proximity to the airport and low operating costs attracted other companies.

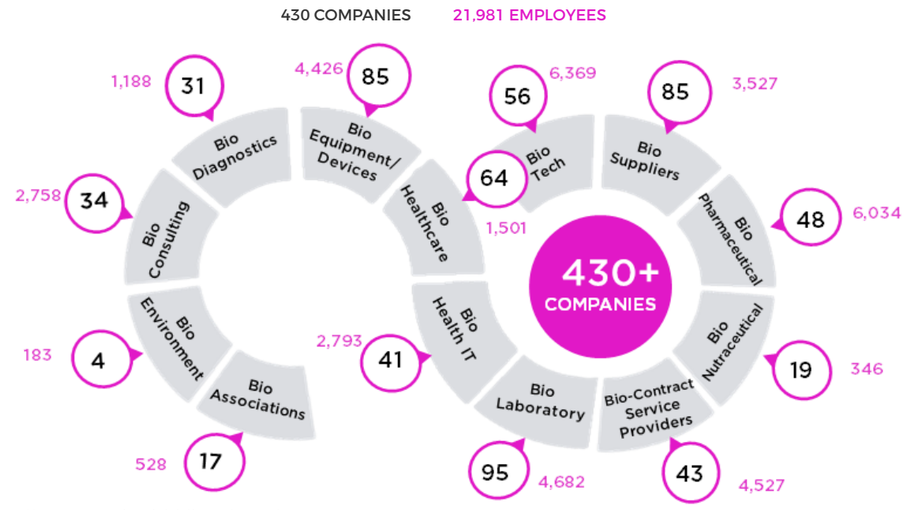
Abbott Laboratories Ltd., Merck Frosst Ltd. and additional industrial and commercial activity followed Astra Pharma's lead by developing and operating distribution centres. The next major company to join the growing cluster was Mallinckrodt Canada Inc., which was later purchased and became DuPont Pharma Inc. (Bristol-Myers Squibb). By the 1980s, the dominant sub-sector was pharmaceuticals with GlaxoSmithKline joining the cluster in 1989. It was also during this time that biotechnology companies started to emerge.

In the 1990s, growth started to boom due to the dynamic cluster of life sciences companies in the Meadowvale Business Park Corporate Centre area, internationally known as "Pill Hill". JLL Global Life Sciences Cluster Report (2014) highlighted this area as the largest life sciences cluster in the suburban Greater Toronto Area (GTA). This cluster attracted other biomedical and biotechnology companies, developed a wider array of products in response to demand and consolidated into new business structures to meet the requirements of the rapidly evolving sector. Between 2003 and 2014, Mississauga's life sciences sector grew: 26% in terms of number of life sciences companies and 11% in total employment.

Today Mississauga's life sciences sector is globally recognized as a significant economic driver. The sector is positioned as the fifth largest life sciences cluster in Canada in terms of number of companies with 430 companies, and the second in terms of employment with over 21,981 employees[4]. The sector includes thirteen sub-sectors ranging from bio-associations to bio-technology. All of the life sciences sub-sectors represent a growing sector that will significantly impact development and growth across Mississauga as well as Ontario and Canada.

4 In comparison to 21 other Canadian municipalities (Census subdivisions), to include Brampton, Burlington, Calgary, Edmonton, Hamilton, Kitchener, Laval, London, Markham, Montreal, Oakville, Oshawa, Ottawa, Quebec City, Saskatoon, St. Catharines, Toronto, Vancouver, Waterloo, Windsor, Winnipeg. Source: City of Mississauga 2015 Employment Database and Statistics Canada, Canadian Business Counts June 2016

Figure 1: Mississauga Life Sciences Sub Sectors



Figures may not add up as some companies are included in more than one sub-sector
Source: City of Mississauga 2015 Employment Database

SUB-SECTORS	DESCRIPTION
Bio-Associations	An Association linked to biotech/pharmaceuticals/medical profession
Bio-Environment	Environment Category Canadian Biotech Book
Bio-Consulting	Consultants linked to research & development(R&D)/management/environmental assessment of biotech, pharma, and medical industries
Bio-Diagnostics	Pharmaceutical, medical, laboratory, and environmental diagnostic, analytical and measuring instruments
Bio-Equipment/Devices	Laboratory equipment, cultures and reagents. Specialised software, laser therapy, hospital equipment, surgical tools, implants, scientific instruments & cardiac equipment
Bio-Healthcare	Manufacturer/distribution. optical products, orthotic products, dental products and first aid
Bio-Health IT	Health IT (Digital Health) and informatics companies
Bio-Laboratory	Research facilities available to conduct scientific research
Bio-Contract Service Providers[5]	Contract Research Organizations (CROs) & Contract Manufacturing Organizations (CMOs)
Bio-Nutraceuticals	Vitamin and mineral health supplements, nutrition analysis
Bio-Pharmaceutical	Manufacturer, research & development, sales of pharmaceutical products (or known pharmaceutical companies with a presence in Mississauga)
Bio-Suppliers	Sales & distribution medical and hospital equipment and supplies. Medical information & service providers. Consulting firms providing service to biomedical & biotechnical areas
Bio-Technology	Bio-technology firms, bio and pharma research & development and contract research and clinical trial firms (or known bio-tech firms with a presence in Mississauga)

5 In earlier EDO life sciences sub-sector definitions, known as Bio-Manufacturing

MISSISSAUGA'S LIFE SCIENCES CLUSTER VS. SECTOR

Cluster: The ecosystem of industry[a] and non-industry stakeholders[b] that revolve around the sector's economic activity and output.

Sector: A sub-set of the cluster as it relates only to the industry stakeholders driving commercial output, and is further defined by thirteen sub-sectors as defined by EDO.

a For- and not-for-profit businesses, including business associations.

b Post-secondary and research institutions, workforce development groups, government agencies, industry associations, chambers of commerce, incubators etc.

Today Mississauga is home to a diverse life sciences ecosystem, that includes the following characteristics and assets:

- The fifth largest life sciences sector across major Canadian cities by total number of companies and the second largest by total employment;
- Over 66 life sciences corporate head office locations;
- A highly educated talent pool: over two-thirds of residents with post-secondary education; a higher proportion of residents with STEMM (science, technology, engineering, mathematics and medicine) training as compared to the GTA and Ontario;
- 21 post-secondary institutions within 1-hour driving distance offering over 300 life sciences and health studies undergraduate and post-graduate programs;
- University of Toronto Mississauga (UTM): Innovation-Cube, Mississauga Academy of Medicine and the Institute for Management & Innovation with specialized life sciences programming including the Master of Biotechnology (MBiotech), Master of Management of Innovation (MMI), Master of Science in Sustainability Management (MScSM) and Master of Science in Biomedical Communications (MScBMC)
  - Future home to world-renowned Dr. Patrick Gunning and the Centre for Medicinal Chemistry;
- Sheridan Institute of Technology and Advanced Learning Hazel McCallion Campus (HMC) with several programs offered in business, marketing and communications;
- Research Innovation Commercialization Centre (RICC) providing entrepreneur and innovation support in a co-located facility with the Xerox Research Centre of Canada; and
- Mississauga's Trillium Health Partners (2 teaching hospital sites: Credit Valley Hospital and Mississauga Hospital) specializing in oncology and cardiology.

In addition, Mississauga is located in the GTA, Ontario-Quebec Life Sciences Corridor and the Kitchener/ Waterloo-Toronto Innovation Corridor – leading regional clusters with a broad array of stakeholders and resources influencing Mississauga's life sciences ecosystem.

Talent is a key element of the 5-year life sciences cluster plan. Mississauga has evolved into a destination point for highly skilled scientists whose potential is enabled by local educational institutes and pharmaceutical/biotech organizations. Alphora Research has contributed to the cluster by creating significant employment and by the professional development of over 100 personnel including Ph.D., chemists, scientists, engineers and support staff. Joining the Mississauga cluster has been truly beneficial to our business.

Dr. Jan Oudenes, President, Alphora

INTRODUCTION

STRATEGY DEVELOPMENT PROCESS

EDO worked in collaboration with the City of Mississauga Business Improvement section, partners and life sciences cluster stakeholders to develop the Strategy. The Strategy development process involved two phases, answering three key strategic questions: "Where are we now?"; "Where do we want to go?"; and "How do we get there?". Key objectives of each project phase are detailed in the following table.

Table 1: Mississauga Life Sciences Cluster Strategy Project Phases and Objectives

1 PHASE ONE	2 PHASE TWO	3 PHASE THREE
Comprehensive Research, Consultation and Analysis	5-Year Mississauga Life Sciences Cluster Strategy and Action Plan	Implementation & Assessment: 2017-2021
• Review the historic and current state of Mississauga's life sciences cluster • Understand perspectives of the cluster as detailed by key cluster stakeholders • Undertake life sciences clusters best practices review and benchmarking • Review emerging trends in the sector • Review current and potential life sciences partnerships and networks • Review government and industry programs and incentives to support the sector • Review the local life sciences cluster's strengths, weaknesses, opportunities and threats (SWOT assessment) and strategic options	• Develop 5-Year Mississauga Life Sciences Strategy and Action Plan • Define success for Mississauga's life sciences cluster • Grow and strengthen the life sciences cluster • Enhance Mississauga's innovation economy and innovation health-care/life sciences support systems • Build networks for partnerships with education, government, business, associations and other key stakeholders	• Short-Term: (1-2 years) • Medium-Term: (3-4 years) • Long-Term: (5+ years)

A range of methods were employed to gain primary and secondary quantitative and qualitative data to shape the Strategy, inclusive of the following:

- **Stakeholder Engagement**
  Engagement of over 136 life sciences stakeholders across more than 70 organizations through roundtable sessions/consultation meetings, one-on-one interviews and online surveys in order to understand local cluster trends, opportunities and challenges.
- **Secondary Data Review and Analysis**
  Comprehensive research and analysis to review the existing state of the local life sciences cluster and future trends.
- **Best Practice Research and Benchmarking**
  Review and analysis of over 65 global life sciences clusters across 18 countries to review cluster development opportunities and threats.
- **Collaborative Sessions**
  Facilitated group brainstorming with key life sciences stakeholders shaped the outcomes of the Strategy, confirmed partner commitment and identified key cluster champions who will support the achievement of the Strategy vision, goals and objectives.

The utilized methodology approach sets the Mississauga Life Sciences Cluster Strategy as a genuine and comprehensive stakeholder-driven initiative. The Strategy development process is further detailed in Appendix A.

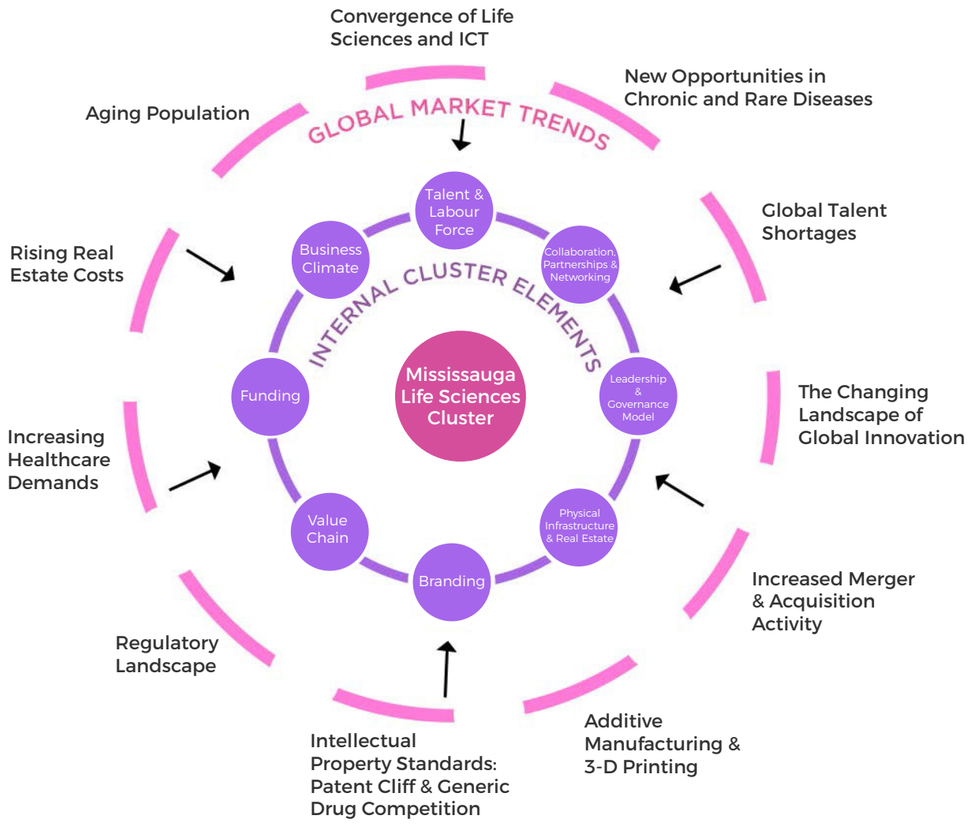
Mayor's Life Sciences Strategy Roundtable

INTRODUCTION

KEY INSIGHTS AND FINDINGS

The evaluation of Mississauga's life sciences cluster is based on the assessment of internal cluster elements deemed as important contributors to the growth and success of well-established clusters through best practice and benchmarking research and stakeholder consultation. In addition, changing socio-economic global trends are driving global life sciences companies to be creative and adopt new business models to become more competitive. These internal cluster elements and global market trends impacting the local life sciences cluster are detailed in the following figure.

Figure 2: Internal Cluster Elements and Global Market Trends Impacting Mississauga Life Sciences Cluster



Nine key observations and lessons derived from the Strategy development process are as follows:

Varying Perceptions of the Local Business Climate

While it was evident that the majority of established life sciences companies viewed Mississauga as an excellent place to do business, this sentiment is not as clear-cut for start-ups/early-stage companies and small and medium-sized enterprises (SMEs). If EDO wants to implement measures that are truly supportive of the full range of local life sciences businesses and stimulate growth within those start-ups/early-stage companies that have high growth potential, there is a critical need to have meaningful and inclusive cluster engagement across the full value chain. Ongoing business retention and expansion efforts and business relationship-building activities need to ensure that the engagement of stakeholders remain representative of Mississauga's entire business community.

2 Support for Early Stage Life Sciences Companies

Mississauga is a preferred location for larger and more established life sciences companies, as evidenced by Mississauga's life sciences companies by employment range in comparison to other municipalities. Statistics Canada Canadian Business Counts data reveals that Mississauga is the number one location for life sciences companies employing 100 to 499 employees across major Canadian cities. More interestingly, while Toronto had the largest number of life sciences companies employing over 500 employees, Mississauga is the number one location for life sciences companies employing over 100 employees (in terms of total companies). Toronto's life sciences ecosystem is characterized with a large number of post-secondary and research institutions and incubators that support innovative start-ups and seed companies. MaRS Discovery District is one example of the incubators located in Toronto that support these smaller companies. These support providers for early stage companies have helped to position Toronto as the number one location for smaller life sciences companies (employing less than 20) across major Canadian cities.

While the City of Mississauga may be deemed as a reasonable landing spot for newly incubated companies seeking to commercialize, grow and mature, the operating reality is not always consistent. In order for Mississauga to be positioned as the ideal landing spot for early-stage life sciences companies that are seeking to grow and commercialize, supportive intervention needs to be undertaken. The provision of reduced rate and shorter-term lease options with appropriate equipment, including lab space, is a provision that should be further evaluated in conjunction with partners. In addition, mentorship programs between established companies and SMEs/start-ups/early stage companies, networking opportunities as well as connections to funding opportunities and service providers may further facilitate innovation and support commercially viable opportunities for these companies.

3 Room for More Partnership and Collaborative Initiatives to Support B2B Opportunities

An overwhelming sentiment highlighted by companies is the need to further engage with other cluster stakeholders to advance organizational and business development interests. Cluster engagement must remain sector-relevant and provide meaningful outcomes for stakeholders. Opportunities for business-to-business (B2B) interaction to address organizational interests and business development opportunities are largely viewed as the main objective of successful cluster engagement. The City has the opportunity to lead the facilitation of such events to provide platforms allowing stakeholders to initiate organic connections in order to address immediate and long-term opportunities and challenges.

4 Talent/Skills Gap

There is a talent/skills gap that is perpetuated through four main forces: (1) Industry and post-secondary institution disconnect in changing workforce training requirements; (2) Lack of mentorship opportunities between experienced life sciences professionals and new graduates and students; (3) Lack of in-house capacity to dedicate resources to mentorships or extensive training (specifically for smaller companies); and (4) Loss of talent to other established life sciences/technology hubs. In consultation with education institutions and workforce development groups, EDO should evaluate programming options to address these four main barriers to bridge the talent/skills gap.

5 Transit and Transportation Development

Appropriate and accessible transit options are necessary for the attraction and retention of talent, particularly new grads and students. Traffic congestion in key life sciences hubs (e.g. Meadowvale Business Park Corporate Centre and Airport Corporate Centre) is further hindering the commuter flow to and from the city. MiWay has many initiatives underway to improve transit delivery across the city. EDO should extensively share these updates with the business community and facilitate opportunities for business community input moving forward to ensure that transit development opportunities address the needs of commuters in highly concentrated employment areas. In addition, EDO should work with various internal and external partners to ensure transit and transportation infrastructure development supports and meets the needs of local companies.

6 Leverage Partner Resources & Seek Collaborative Measures to Mitigate Duplication of Services

In order to encourage a cohesive ecosystem, non-industry stakeholders providing support and resources for cluster growth and development need to work in collaboration to ensure that companies have a clear understanding of the range of support services available and to reduce confusion of where to seek support. EDO should take a leading role in coordinating efforts among non-industry stakeholders and finding opportunities for synergies and pooling of resources, specifically where organizational/programming mandates and operating goals remain similar and connected.

7 Sector-Driven Engagement and Collaborative Empowerment

Creating meaningful programming that addresses cluster challenges and opportunities requires initiatives that are driven by industry stakeholders with non-industry stakeholders, including the City of Mississauga, supporting industry directive and coordinating efforts. Industry stakeholders should be empowered to take the initiative to shape the vision and outcomes of the future state of Mississauga's life sciences cluster.

8 EDO as Life Sciences Cluster Development Integrator and Enabler

EDO has remained an active leader in championing life sciences as a vital and key sector of Mississauga's economy. Best practice research highlights the importance of community stakeholders – with key emphasis on industry – taking a vested interest in the strategic leadership of cluster development initiatives. EDO should remain an integrator and enabler of opportunities and support to ensure that the local business community remains competitive and is able to thrive and grow. Rather than setting industry direction, EDO should ensure that foundational pieces are in place to set the stage for opportunities for meaningful cluster engagement and collaboration. EDO will continue to lead efforts to facilitate an open and nurturing business environment that encourages synergistic connections amongst stakeholders and leverage the expertise and resources of partners in establishing initiatives that are responsive to industry needs and direction.

9 Transition into an Innovation District(s) and Innovation Ecosystem

Global best practice research identifies the transition of traditional research park models to more flexible uses that best meet business needs. Innovation districts with an emphasis on a mix of uses (e.g. office, research, co-working space, incubation space, etc.), the facilitation of linkages across a number of stakeholders and the development of a sense of place has the potential to transition Mississauga into a vital and critical life sciences innovation hub. Furthermore, links with regional innovation clusters should be strengthened to leverage resources and assets. This will ultimately solidify Mississauga as a thriving local innovation ecosystem.

INTRODUCTION

MOVING FORWARD: OUR FUTURE

Mississauga has the opportunity to bolster the local life sciences cluster as a world-renowned centre for technological and medical advancements. This can only be achieved through the provision of an enabling environment that encourages connections, collaboration, inclusion and cohesion between cluster stakeholders. The Strategy development process allowed EDO to thoroughly examine the local life sciences cluster in order to enact meaningful change.

The reality: Mississauga has many of the right ingredients to catalyze the cluster to the next level of industry productivity, innovation and export-competitiveness.

What is now needed: Specific and decisive actions addressing the identified cluster challenges, gaps and opportunities.

Now is the time to take action. Many stakeholders identified the need for a formal life sciences cluster strategy at either the national, provincial, regional or municipal level. The amount of interest and excitement warranted from local and regional stakeholders throughout the development of this Strategy is one indicator of this need. Through the development of this Strategy, Mississauga is now positioned as a cutting-edge city amongst leading Canadian life sciences destinations.

The Strategy will elevate Mississauga's life sciences cluster on the global stage to support local economic growth and prosperity.

> *As an emerging technology company, I was happy to participate in the Mayor's Roundtable to participate and interact with other leading Life Sciences executives about the issues and opportunities to grow the medical device cluster in Mississauga. Prolucid Technologies has grown significantly from startup to 25 employees with a plan to continue to expand even more as we focus on providing medical device connectivity and commercialization to a growing list of innovative medical device companies. The talent is here and helping develop the cluster will result in growth for Prolucid and surrounding companies, creating highly skilled technology jobs in the region.*
>
> Annalee Sawiak, Chief Financial Officer, Prolucid Technologies

MISSISSAUGA LIFE SCIENCES CLUSTER STRATEGY

Professor Patrick Gunning, Ph.D., B.Sc., Department of Chemical & Physical Sciences, University of Toronto Mississauga (UTM)

and Dr. Eugenia Duodu, UTM graduate and member of the Gunning Group lab

MISSISSAUGA LIFE SCIENCES CLUSTER STRATEGY

OUR SHARED VISION

The strategic direction set forth in this document represents the collective vision and aspirations for Mississauga's life sciences cluster. As a community-based strategy, the achievement of this vision will largely be based on inclusion and collaboration between cluster stakeholders. The identified actions are therefore a shared responsibility, requiring continuous commitment and interaction between industry, government, research and post-secondary institutions, business incubators/accelerators, workforce development groups, industry associations, chambers of commerce and other not-for-profit groups. The Strategy represents a series of key distinguished yet interconnected actions that will shape the future outcomes and success of Mississauga's life sciences cluster.

> "Mississauga is the connected ecosystem that cultivates and nurtures commercialization of life sciences innovations: A proven destination where diverse companies and exceptional talent grow, succeed and prosper."

MISSISSAUGA LIFE SCIENCES CLUSTER STRATEGY

GUIDING PRINCIPLES

Key observations and lessons identified in Section I shaped the development of four strategic guiding principles. These guiding principles represent the underlying themes of which this Strategy is based on and are detailed as follows:

CREATE INCLUSIVE BUSINESS-DRIVEN NETWORKS

Moving forward it will be important to have a cohesive and engaging cluster that is inclusive across the full value chain including large multinational companies to SMEs and early-stage start-ups and newcomers. Meaningful outcomes for the cluster can only be actualized through the leadership and guidance of the business community. Mississauga has the opportunity to be distinguished as a city that prides business leadership by providing a formal platform that engages life sciences business leaders to advise and oversee the growth and development of the local cluster. Through the establishment of cluster champions and a consortium led by cluster stakeholders, meaningful outcomes for all stakeholders will become apparent. EDO will continue to facilitate connections by integrating partners and stakeholders into cluster development programs and initiatives.

CULTIVATE THE INNOVATION ECOSYSTEM

While there has been some momentum in place with the establishment of corporate centres and research parks, the City has the opportunity to provide planning provisions, and physical/transportation infrastructure that supports the transformation into innovation districts. These districts will better facilitate environments that attract and retain talented workers, who increasingly want to live, work, and play in dense urban areas that contain high concentrations of cultural amenities, links to transportation, and attractive public spaces.

Furthermore, it will be important for the future growth and development of the cluster to integrate companies, post-secondary and research institutions and workforce development groups to ensure that the local talent base meets the needs of the rapidly evolving workplace. Synergies apparent in other key sectors such as ICT and advanced manufacturing have the opportunity to enhance the trajectory of life sciences. This is evidenced in trends such as the internet of things (IoT), big data, genomics and automation currently being addressed in health informatics, contract manufacturing and research. Mississauga is on the cusp of something big.

ENHANCE GLOBAL & REGIONAL CLUSTER CONNECTIVITY

It is important for the local cluster to not operate in a silo. Connecting with regional partners – by leveraging resources, funding and assets to elevate and develop the local sector – will remain critical. Many of the best practice life sciences clusters are in fact regions. Mississauga has the opportunity to better integrate with the Ontario-Quebec Life Sciences Corridor, the Kitchener/Waterloo-Toronto Innovation Corridor and other leading international life sciences clusters – clusters with a wealth of resources and international brand recognition. Particularly for program implementation, it will be important for EDO and its partners to mitigate duplication of services in order to create a cohesive regional innovation ecosystem.

ATTRACT & GROW

EDO will continue to champion business interests by being client-centric and monitoring the pulse of the local economy. While business attraction will continue to spur development and growth in the local life sciences cluster, EDO will continue to focus efforts in supporting the suite of local companies. This is important as the Economic Developers Association of Canada states that: Existing businesses will account for as much as 80% to 90% of economic growth in a community; and 70% to 85% of new foreign direct investment is add on investment by multinational corporations already established in a community. Business retention and expansion remains an integral component of economic growth and development.

EDO will continue to be proactive by anticipating changes in the cluster and working with partners to implement measures that lead to the best outcomes for the cluster. Ongoing consultation led by the Life Sciences Business Consultant will be prioritized as EDO will continue to connect with cluster stakeholders to learn about continually evolving and pressing challenges and opportunities. The facilitation of an open and welcoming environment to support the full range of life sciences companies across the value chain will remain critical.

McKesson recently expanded our footprint in the Greater Toronto Area - we chose Mississauga as the home of our new regional corporate office. The City of Mississauga's proactive approach to strengthening the life sciences and broader pharmaceutical supply chain sector through established networks and corporate partnerships helped make the decision an easy one to make.

Daniel Chiasson, Vice President, Supply Solutions, McKesson Canada

As a leading Canadian life sciences cluster, Mississauga has an active role to play in strengthening Ontario's life sciences sector and securing our future economic and social prosperity. This strategy identifies Mississauga's unique attributes that can support the life sciences industry, and provides action items to achieve this within the context of the growing Ontario life sciences supercluster.

Dr. Jason Field, President, Life Sciences Ontario

CREATE INCLUSIVE BUSINESS-DRIVEN NETWORKS

Goal 1: Opportunities for Life Sciences Partnerships and Leadership

- Objective 1.1: Establish Local Life Sciences Cluster Champions as the Formal Cluster Governing Structure and Advisory Body

Goal 2: Opportunities for Effective Networking and Collaboration

- Objective 2.1: Coordinate B2B Networking Initiatives to Connect the Life Sciences Ecosystem
- Objective 2.2: Facilitate an Open Innovation Environment

CULTIVATE THE INNOVATION ECOSYSTEM

Goal 3: A Robust Life Sciences Talent Pipeline

- Objective 3.1: Enhance and Develop Training/Workforce Development Programs and Talent Connections

Goal 4: Access to Efficient Transit Options

- Objective 4.1: Develop Business-Friendly Transit Options

Goal 5: A Centralized Life Sciences Hub

- Objective 5.1: Lead the Development of a Mississauga Life Sciences Innovation District

ENHANCE GLOBAL & REGIONAL CLUSTER CONNECTIVITY

Goal 6: A Proven Destination for Life Sciences

- Objective 6.1: Empower Local Life Sciences Cluster Leaders
- Objective 6.2: Leverage Local Partner Resources to Create a Cohesive Local Life Sciences Support Ecosystem
- Objective 6.3: Leverage Regional Resources and Assets
- Objective 6.4: Develop International Linkages with Globally Significant Life Sciences Clusters

ATTRACT & GROW

Goal 7: A Supportive Business and Investment Environment

- Objective 7.1: Facilitate an Open, Welcoming and Supportive Business Environment
- Objective 7.2: Monitor the Pulse of the Local Cluster
- Objective 7.3: Attract, Retain and Expand Life Sciences Companies

MISSISSAUGA LIFE SCIENCES CLUSTER STRATEGY

ACTION PLAN

Timing:
Short-Term (1-2 years);
Medium-Term (3-4 years);
Long-Term (5+ years)

The following Action Plan represents a living document that will remain open to evolving over the course of the Strategy to adapt to emerging economic trends and reflect the operating realities of the cluster. Refer to Appendix E for a description of identified leads, partners and key performance indicators.

CREATE INCLUSIVE BUSINESS-DRIVEN NETWORKS

GOAL 1: Opportunities for Life Sciences Partnerships and Leadership

OBJECTIVE 1.1: Establish Local Life Sciences Cluster Champions as the Formal Cluster Governing Structure & Advisory Body

ACTION	TIMING	LEAD(S)	SUPPORT
i. Mississauga Life Sciences Consortium Leadership: Develop the Mississauga Life Sciences Consortium as the formal cluster governance model composed of life sciences business leaders. The Mississauga Life Sciences Consortium will: • Provide advisory support and direction to the cluster; • Identify local cluster challenges and opportunities to relay to EDO and partners; • Implement, oversee and evaluate cluster strategy actions and outcomes; and • Create opportunities for B2B networking and collaboration amongst stakeholders. Upon the launch of the Strategy, the City will issue a statement to the Province about the importance of the life sciences sector to Mississauga, Ontario and Canada.	*Short-Term*	Identified Cluster Champions	EDO, MBOT

GOAL 2: Opportunities for Effective Networking and Collaboration

OBJECTIVE 2.1: Coordinate B2B Networking Initiatives to Connect the Life Sciences Ecosystem

ACTION	TIMING	LEAD(S)	SUPPORT
i. Themed Networking Events, Roundtables and Seminars: Create, host and sponsor themed networking events, roundtables and seminars in collaboration with partners. International cluster leaders will be invited to facilitate sessions and/or be keynote speakers in order to provide best practice insight and create opportunities for the transfer of knowledge. Possible themes include, but are not limited to: general networking, angel investor networking, government incentives seminars, Mississauga development approval process seminars, international market expansion, mentorship networking, regulatory landscape roundtable, talent and workforce development roundtable (connecting industry with post-secondary institutions), healthcare institution procurement sessions and trends and opportunities in life sciences roundtables.	*Short-Term*	EDO	OCE, EDC, RICC, UTM, BioTalent, Sheridan, MaRS Discovery District, LSO, OBIO/OBEST, MBOT

OBJECTIVE 2.1 (Continued): Coordinate B2B Networking Initiatives to Connect the Life Sciences Ecosystem

ACTION	TIMING	LEAD(S)	SUPPORT
ii. Mississauga Online Business Concierge: • Ensure that the new Mississauga Business Directory through Open Data is a user-friendly business concierge that facilitates B2B interactions and labour force connections by developing an online network. • Create a virtual shared space for innovation and collaboration amongst cluster stakeholders by maintaining a web forum to share knowledge, ideas and create connections (e.g. Virtual Park).	*Medium-Term*	Information Planning, EDO	LSO, TO Health!, Provincial Government

OBJECTIVE 2.2: Facilitate an Open Innovation Environment

ACTION	TIMING	LEAD(S)	SUPPORT
i. Connect Academic and Healthcare Institutional Researchers with Life Sciences Companies: Connect academic and healthcare institutional researchers with life sciences companies to facilitate an open innovation environment in R&D/discovery phases. Leverage the UTM Centre for Medicinal Chemistry to build capacity/specialty in this realm.	*Medium-Term*	EDO	UTM, Sheridan, Industry
ii. Open Innovation Conferences and Events: Develop and host conferences and events to facilitate a life sciences open innovation community of practice: A collective learning experience.	*Medium-Term*	EDO	UTM, Sheridan, Industry, LSO, OBIO/OBEST, OCE, MEDEC, Innovative Medicines, BIOTECanada, BioTalent

KEY PERFORMANCE INDICATORS - CREATE INCLUSIVE BUSINESS-DRIVEN NETWORKS

Number of Mississauga Life Sciences Consortium meetings held annually.

Number of industry-relevant themed events hosted/supported annually.

Number of attendees participating in themed networking events, roundtables and seminars annually.

Client satisfaction ratings from the themed networking events, roundtables and seminars garnered through event satisfaction surveys.

Number of connections facilitated by the Open Data Business Directory annually.

Number of facilitated connections between researchers and companies over the course of the Strategy timeframe.

Number of life sciences open innovation conferences and events hosted annually.

CULTIVATE THE INNOVATION ECOSYSTEM

GOAL 3: A Robust Life Sciences Talent Pipeline

OBJECTIVE 3.1: Enhance and Develop Training/ Workforce Development Programs and Talent Connections

ACTION	TIMING	LEAD(S)	SUPPORT
i. Industry-Academic-Workforce Development Programs: • Encourage Mississauga life sciences companies to utilize internship or co-op programs to hire students. Promote and encourage the social impact of internships/co-ops in SMEs in order to further engage students and new graduates; • Work with educational institutions to develop/expand specialized programs related to life sciences (e.g. Good Manufacturing Practice, Good Laboratory Practice) and promote careers in life sciences as opportunities amongst young people; • Promote BioTalent to internationally-trained life sciences and healthcare professionals to explore opportunities available in life sciences; and • Establish a forum with regional cluster stakeholders to identify talent/skills gaps and needs for new training programs. • Encourage companies to share workforce needs, industry trends and demands with EDO and educational institutions.	*Short-Term*	BioTalent, UTM School of Continuing Studies, Sheridan Faculty of Continuing & Professional Studies	EDO
ii. Opportunities with Educational Institutions: • Promote "all experience is relevant" in all levels of education in order to encourage students' development of soft and transferable skills; • Encourage opportunities to connect students, new grads and internationally-trained professionals to life sciences companies through various means, such as job shadowing, job fairs, internships and a collaborative centre; • Advocate for longer degree program options that allow students to better manage school and work responsibilities; • Introduce an "Open Doors" field trip model to encourage students to visit local life sciences companies.	*Medium-Term*	UTM, Sheridan, Provincial Government, Peel District School Board, Dufferin-Peel Catholic District School Board, Select post-secondary institutions from throughout the region, Private Schools	EDO
iii. Ten Thousand Coffees – Mississauga: Leverage the web-based tool, Ten Thousand Coffees, to create a Mississauga Life Sciences Cluster branded resource that connects students, new grads, internationally-trained life sciences and healthcare professionals, start-ups and SMEs with mentorship support and service providers.	*Medium-Term*	RICC, MBOT, LSO, MaRS Discovery District, BioTalent, Other select regional incubators	EDO

GOAL 4: Access to Efficient Transit Options

OBJECTIVE 4.1: Develop Business-Friendly Transit Options

ACTION	TIMING	LEAD(S)	SUPPORT
i. Transit-Business Working Group Initiate Pilot Strategies: Develop the Transit-Business Working Group to initiate pilot strategies with landlords to address transit hot spots. Survey local life sciences companies to understand transit challenges.	*Short-Term*	T&W, MiWay, EDO, Metrolinx, TTC, Brampton Transit, Oakville Transit, Smart Commute	Provincial Government, Federal Government

GOAL 5: A Centralized Life Sciences Hub

OBJECTIVE 5.1: Lead the Development of a Mississauga Life Sciences Innovation District

ACTION	TIMING	LEAD(S)	SUPPORT
i. Mississauga Life Sciences Innovation District: Create a Life Sciences Innovation District(s) to support early-stage companies looking to commercialize, grow and mature: • Conduct a feasibility study to explore the possibility of developing an innovation district(s) in key areas (e.g. Adjacent to the hospitals (Hurontario, Queensway and Credit Valley), Lakeview, Advanced Material Manufacturing Centre, UTM Special Purpose Area - Centre for Medicinal Chemistry and Downtown Core and other potential sites). Special emphasis should be placed on developing a model that acknowledges and encourages sector activity amongst existing life sciences hubs (e.g. evaluating a networked innovation district amongst various nodes of the city), ensuring there is good transit access and active transportation options, guaranteeing the provision of reduced rate/shorter-term lease rates, and the evaluation of funding opportunities; • Review the successes and challenges of existing corporate centres and business parks; • Establish formal linkage programs between existing incubation hubs (e.g. MaRS Discovery District) to land newly incubated life sciences companies in Mississauga and provide necessary resources and support through the Mississauga Life Sciences Innovation District; and • Create an Innovation Café as an initial testing/launching concept for an innovation district.	*Long-Term*	EDO, Planning & Building, Mississauga Life Sciences Consortium	Provincial Government, Federal Government, Industry, MaRS Discovery District, Trillium Health Partners, NRCC

KEY PERFORMANCE INDICATORS - CULTIVATE THE INNOVATION ECOSYSTEM

Number of newly-initiated education/training programs targeted to support interest in the life sciences sector over the course of the Strategy timeframe.

Number of mentorship connections between retired life sciences professionals and companies/individuals annually.

Number of new transit initiatives derived from the Transit- Business Working Group over the course of the Strategy timeframe.

Upon the launch of Innovation Café/Innovation District:
- Number of engaged participants
- Number of collaborative initiatives created through connections started

ENHANCE GLOBAL & REGIONAL CLUSTER CONNECTIVITY

GOAL 6: A Proven Destination for Life Sciences

OBJECTIVE 6.1: Empower Local Life Sciences Cluster Leaders

ACTION	TIMING	LEAD(S)	SUPPORT
i. Widen the Pipeline of Cluster Champions: Develop and launch a major internal marketing initiative through education sessions, social media updates and other means to increase internal stakeholders' awareness of the existing cluster and buy-in for the brand. The internal marketing campaign will identify new cluster champions to be involved in the Mississauga Life Sciences Consortium. Engage prominent cluster leaders to help promote Mississauga's life sciences cluster.	*Short-Term*	EDO	Mississauga Life Sciences Consortium

OBJECTIVE 6.2: Leverage Local Partner Resources to Create a Cohesive Local Life Sciences Support Ecosystem

ACTION	TIMING	LEAD(S)	SUPPORT
i. Advocate for a Cohesive Life Sciences Sector Support Ecosystem: Support collaborative Provincial initiatives that foster cohesion amongst sector support organizations, such as a public/private life sciences working group. Initiate the request to the Province to undertake a study to understand the operating mandates of life sciences cluster non-industry stakeholders (e.g. support providers, associations etc.) and identify apparent overlaps and gaps in the current sector support ecosystem. The study will: • Ensure resources are used effectively and efficiently; • Align services and reduce duplications; • Encourage organizations to work collaboratively in order to advance the life sciences sector; and • Bring clarity to the roles and services of all non-industry stakeholders.	*Medium-Term*	EDO, Provincial Government	Toronto Global, TO Health!, LSO, OBIO/ OBEST, OCE, MEDEC, Innovative Medicines, BIOTECanada, BioTalent

OBJECTIVE 6.3: Leverage Regional Resources and Assets

ACTION	TIMING	LEAD(S)	SUPPORT
i. Leverage the Regional Significance of Leading Local Institutions: • Leverage the regional significance and world-class prestige of leading newly or soon-to-be developed institutions to increase/enhance company connections and develop commercialization opportunities; • Leverage the newly announced National Research Council Advanced Material Manufacturing Centre to grow the medical device cluster; and • Leverage potential sector centres of excellence to increase sub-sector specialty.	*Medium-Term*	EDO	UTM, Xerox Research Centre, Advanced Material Manufacturing Centre

OBJECTIVE 6.3 (Continued): Leverage Regional Resources and Assets

ACTION	TIMING	LEAD(S)	SUPPORT
ii. Leverage Regional Cluster Development Initiatives: • Take a more active role in regional marketing/development organizations in order to facilitate regional connections and allow local companies to gain access to a broader network of contacts and resources; • Promote the cluster at a regional level by collaborating and pooling resources with the broader region in order to facilitate effective brand recognition for the corridor (e.g. Leverage Ontario's strong global reputation for excellence in conducting clinical trials and support from non-profit organizations such as Clinical Trials Ontario); • Provide the Mississauga sector database/directory to external groups detailing cluster maps/directories across larger regions on an annual basis to create company connections and promote the entire cluster; and • Connect the Mississauga Life Sciences Consortium as the point of contact with regional corridors and/or cluster initiatives.	*Medium-Term*	EDO	Quebec-Ontario Life Sciences Corridor, Kitchener/ Waterloo-Toronto Innovation Corridor, Other regional clusters, TO Health!, Toronto Global, UTM, Sheridan, Trillium Health Partners, Clinical Trials Ontario, LSO, OBIO/OBEST, Contact Canada, Provincial Government, Federal Government, Industry

OBJECTIVE 6.4: Develop International Linkages with Globally Significant Life Sciences Clusters

ACTION	TIMING	LEAD(S)	SUPPORT
i. Develop and Build New Relations with Select Leading International Life Sciences Clusters and Promote Mississauga Globally: Through the actions identified under the guiding principle, "Enhance Global & Regional Cluster Connectivity", build capacity to increase international awareness of Mississauga's cluster. Over the long-term, develop and build new relations with leading international life sciences clusters to attract new investment, develop reciprocal agreements and partnerships and create new opportunities for local companies in international markets. Initiate connections based on parent company locations of Mississauga companies.	*Long-Term*	EDO, Toronto Global, MIPP, Mississauga Life Sciences Consortium	TO Health!, LSO, BIOTECanada, OBIO/OBEST, MEDEC, Innovative Medicines

KEY PERFORMANCE INDICATORS - ENHANCE GLOBAL & REGIONAL CLUSTER CONNECTIVITY

Number of life sciences stakeholders identified as Mississauga life sciences cluster champions over the course of the Strategy timeframe.

Number of regional cluster development/marketing initiatives Mississauga is engaged in over the course of the Strategy timeframe.

Number of partnerships initiated with leading international life sciences clusters over the course of the Strategy timeframe.

ATTRACT & GROW

GOAL 7: A Supportive Business and Investment Environment

OBJECTIVE 7.1: Facilitate an Open, Welcoming and Supportive Business Environment

ACTION	TIMING	LEAD(S)	SUPPORT
i. Facilitate Access to Funding Opportunities: Facilitate the removal of obstacles preventing companies from accessing available funding programs. Identify local life sciences companies that need support and link them to support providers that can: • Provide knowledge and guidance about available provincial and federal funding programs for life sciences stakeholders; and • Identify incentives for post-secondary institutions to expand programs to address the skills gap.	*Short-Term*	Ontario Centre of Excellence (OCE), BioTalent	EDO, Provincial Government, Federal Government, UTM, Sheridan, LSO
ii. Support to Start-ups and SMEs to Navigate the Regulatory Landscape Connect life sciences start-ups and SMEs with regulatory compliance support providers to help companies understand and navigate the life sciences regulatory landscape.	*Medium-Term*	RICC, MEDEC, Consulting firms, LSO, OBIO/OBEST, OCE, MEDEC, Innovative Medicines, BIOTECanada, Health Canada	EDO

OBJECTIVE 7.2: Monitor the Pulse of the Local Cluster

ACTION	TIMING	LEAD(S)	SUPPORT
i. Mississauga Life Sciences Business Retention and Expansion Program: Launch the formal Mississauga Life Sciences Business Retention & Expansion (BR&E) Program to engage local cluster stakeholders. Utilize a standardized survey to understand current business challenges and opportunities and create a dialogue between companies in order to facilitate supportive interventions (e.g. development approval process guidance/assistance, information, resources, etc.). The BR&E Program will promote a positive local business environment where existing companies choose to stay and grow.	*Short-Term*	EDO	Mississauga Life Sciences Consortium, MBOT, Provincial Government, Federal Government
ii. Inventory Company Functions to Identify Growth Opportunities and Key Emerging Sub-Sectors: Conduct an environmental scan to inventory company functions to understand their capacities and specialities in Mississauga (e.g. 3-D technologies, stem cell, rare diseases). This inventory will: • Provide information for the new Mississauga Online Business Concierge – a tool for the business community to identify specific service providers, suppliers and customers for business development purposes; and • Provide direction for the development and delivery of services (e.g. education, government) to support companies in newly identified growth opportunities and key-emerging sub-sectors.	*Medium-Term*	EDO	Information Planning, LSO

OBJECTIVE 7.3: Attract, Retain and Expand Life Sciences Companies

ACTION	TIMING	LEAD(S)	SUPPORT
i. Attract Offshored Manufacturing/Contract Manufacturing Operations and Global Mandates: Facilitate a local environment that warrants the business case for the attraction of manufacturing/contract manufacturing operations and global mandates to Mississauga. Evaluate opportunities to develop outreach and facilitation methods.	*Long-Term*	Toronto Global, Provincial Government, Federal Government	EDO
ii. Repatriate Offshored Manufacturing/Contract Manufacturing Operations and Global Mandates: Support local companies with offshored manufacturing/ contract manufacturing operations to develop business cases to repatriate global manufacturing mandates to Mississauga. Evaluate key local companies to identify opportunities and develop custom information products for global company decision makers.	*Short-Term*	EDO	Provincial Government, Federal Government

KEY PERFORMANCE INDICATORS - ATTRACT & GROW

Number of new life sciences business investments (inclusive of new investments, retention and expansion activities) annually.

Number of life sciences companies connected with leads to support services in the grant/funding application process annually.

Number of life sciences start-ups and SMEs connected with leads to support services in the navigation of the regulatory landscape annually.

Number of companies visited as part of the Mississauga Life Sciences Business Retention & Expansion Program annually.

Client satisfaction ratings of EDO support services delivered through the Mississauga Life Sciences Business Retention and Expansion Program annually as detailed in the bi-annual EDO Client Satisfaction Survey.

> *Baylis Medical has recently expanded our operations in Mississauga and doubled in size…it is a great location for talent and business growth. Our success here has allowed us to expand into other global markets and most recently into Munich, Germany.*
>
> Kris Shah, President, Baylis Medical

PUTTING IT INTO ACTION

Downtown Mississauga Skyline

PUTTING IT INTO ACTION

IMPLEMENTATION

The Action Plan provides a clear overview of the collaborative initiatives that EDO and its partners will undertake to support the growth and development of the cluster. The Mississauga Life Sciences Consortium will be instrumental in advising and overseeing strategic actions. Clear implementation and evaluation methods will remain vital in the effectiveness of this Strategy.

The majority of identified actions require no additional budget requests as the costs can be covered under the operating budgets of EDO and its partners. Only a select number of actions have been identified to warrant additional analysis and business cases to articulate the resources required to move forward with the Strategy implementation. On an annual basis, these actions will be reviewed as part of EDO's work planning process. Actions that require additional budget requests and resources may be added or removed based on the changing operating realities of EDO and its partners over the course of this Strategy. Where possible, funding opportunities will be explored through partnerships and Provincial and Federal government funding envelopes.

As part of the implementation process, the key performance indicators highlighted in the Action Plan will be evaluated and monitored on an annual basis to track the progress of the Strategy over time.

This Strategy marks the opportunity for local cluster stakeholders to align priorities and activities that will ensure the achievement of the strategic vision.

It is wonderful to be a partner with the City of Mississauga Economic Development team (EDO) and to support their leadership of the development of strategies and initiatives that will help advance Mississauga's life sciences cluster. UTM will continue to invest in educational and research programs that will provide the talent required for the sector, and innovations that will lead to commercial opportunities in areas such as medicinal chemistry and health technologies.

Dr. Ulrich Krull, Interim Vice President and Principal,
University of Toronto (UTM)

Trillium Health Partners, Credit Valley Hospital

APPENDICES

Sheridan Institute of Technology and Advanced Learning

Hazel McCallion Campus

APPENDIX A

STRATEGY DEVELOPMENT PROCESS

SECONDARY DATA REVIEW & ANALYSIS

A review of the state of the local life sciences cluster was undertaken through the use of existing secondary data sources. Key select data sources included the City of Mississauga Employment Database, Statistics Canada Canadian Business Counts data, past/recent investment news and first-hand knowledge and insight from EDO staff.

Historic and current growth trends of the cluster were reviewed. Current characteristics of the cluster were also reviewed to understand the number of life sciences companies and employees by employment range, top employers, comparison of municipalities with the largest number of life sciences companies by employment range, recent sub-sector activity, key assets and resources forming the life sciences cluster, former Mississauga life sciences companies that have relocated to other jurisdictions, and international market representation from locally based life sciences multinational corporations. Furthermore in an attempt to understand the future state of the cluster, global market trends and its implications for the local cluster were reviewed. These external/ global market trends included the following:

- Aging population
- Global talent shortages
- Increased merger & acquisition activity
- The changing landscape of global innovation
- Capitalize on emerging opportunities in chronic and rare diseases, additive manufacturing/3-D printing and personalized medicine
- Intellectual property standards, patent cliff and generic drug competition
- Regulatory landscape
- Increasing healthcare demands
- Convergence of life sciences and ICT
- Rising real estate costs through global jurisdictions

Analytical methods – such as location quotient analysis, shift share analysis and a North American Industry Classification System (NAICS) codes comparison across Canadian municipalities[6] – were undertaken to form insights about the competitiveness of the cluster. This information helped to form new insights about the cluster to include new and emerging cluster specializations, value propositions, a competitor landscape review and naturally occurring/potential links and synergies between the local cluster and the broader region.

6 In keeping with best practices, EDO implemented the approach established by Life Sciences Ontario (LSO) in the 2015 LSO Report in order to utilize a NAICS approach to define and measure growth and impacts of the life sciences sector and benchmark Mississauga as compared to other Canadian municipalities.

BEST PRACTICE RESEARCH AND BENCHMARKING

A best practice review of over 65 global life sciences clusters across 18 countries was undertaken to review key competitors, influencers, challenges and factors of growth that have positioned these regions as globally competitive life sciences hubs. Best practice research and benchmarking was important in: (1) understanding what was happening globally in the sector; (2) understanding how Mississauga compares to competitors; and (3) understanding gaps and identifying potential options to further advance the local life sciences cluster. In addition, a quantitative analysis was undertaken to benchmark Mississauga against other Canadian life sciences clusters (at the municipal level) through a review of key economic indicators. The following figure highlights the reviewed life sciences clusters.

Figure 3: Global Life Sciences Clusters

Table 2: Global Life Sciences Cluster Research

COUNTRY	LIFE SCIENCES CLUSTERS
Canada	Guelph, Hamilton, Laval, Mississauga, Markham, Montreal, Oakville, Ottawa, Toronto, Vancouver
United States	Cambridge, Boston, North Carolina Research Triangle Park Region, San Diego, Maryland, San Francisco, Massachusetts, Arizona, New York, Minneapolis
Mexico	Mexico City, Guadalajara
Puerto Rico	North, Metro Northeast, East, Southeast, South, Southwest Metro
Brazil	São Paulo, Minas Gerais, Rio de Janeiro, Rio Grande do Sul
China	Beijing Daxing District, Shanghai Zhangjiang Hi-Tech Park, Beijing Zhongguancun (ZGC) Life Science Park, Suzhou Industrial Park's BioBay, Chengdu's Tianfu Life Science Park (TLSP), Chengdu International Health City (CIHC) and Singapore-Sichuan Hi-Tech Innovation Park (SSCIP)
India	Gujarat (Ahmedabad: Changodar-Bavla Corridor, Kalol, Sanand), "Genome Valley" in the state of Andhra Pradesh, Kamataka (Bangalore: Bommasandra Industrial Estate, Peenya Industrial Estate, Tumkur Road, Old Madras Road)
Indonesia	Greater Jakarta Industrial Estate, Jababeka Industrial Estate
South Korea	Osong Bio Valley, Chungcheong Province
Singapore	Tuas Biomedical Park, Biopolis
Australia	Sydney, Melbourne
Japan	Kobe Biomedical Innovation Cluster (KBIC), Tsukuba Science City
France	Paris Region, Lyon Region
Germany	Berlin-Bradenburg Capital Region, Munich/Bavaria Biotech Cluster
Israel	Tel Aviv
Netherlands	Leiden Region, Utrecht, Amsterdam Region, Eindhoven
Switzerland	Basel Region, Zurich Region, Geneva
United Kingdom	London, Cambridge, Oxford, North West England, Scotland

The evaluation of Mississauga's life sciences cluster is based on an assessment of how Mississauga's cluster compares in nine key areas that are commonly highlighted as important contributors to the growth and success of well-established clusters through best practice research and benchmarking.

These key areas are as follows:

- Talent and labour force
- Collaboration, partnerships and networking
- Leadership and governance model
- Access to innovation
- Physical infrastructure and real estate
- Branding and marketing
- Value chain
- Funding
- Business climate

STAKEHOLDER ENGAGEMENT

Fundamental to the Strategy development process was stakeholder engagement – ensuring that the Strategy captures the aspirations and vision of stakeholders who drive and support sector economic activity and innovation. In total, EDO engaged with over 136 life sciences stakeholders across more than 70 organizations. See Appendix B for the list of stakeholders engaged in the Strategy development process. Stakeholder engagement was divided across two project phases:

Phase One

Between June 2015 and April 2016, EDO consulted with a range of cluster stakeholders, including industry[7] and non-industry stakeholders[8], to gain perspective into the sector through a review of trends, opportunities and challenges.

EDO met with industry and non-industry leaders, business development professionals and sector specialists. Phase One stakeholder consultation was completed across three methods as highlighted in Figure 4.

The Mayor's Roundtable was formatted as an open discussion during the 2015 BIO International Conference held in San Francisco. Main discussion themes included talent, access to capital, Mississauga's life sciences community and cluster development opportunities.

Interview guides were created for the in-person interviews (one non-industry discussion guide and one industry discussion guide) and online survey (with paths for both industry and non-industry stakeholders) in order to gain insights around a variety of topics.

Topics covered included:

- Life Sciences Sector Landscape: A review of the general outlook of the sector and the most pressing challenges and opportunities;
- The Company (Industry Discussion Guide Only): A review of organizational plans for growth/change within the foreseeable future and discussion around changes in the regulatory landscape impacting organizational growth;
- Talent and Workforce Development: A review of the local labour force and measures undertaken to tap into post-secondary institutions/government programs to address labour force needs;
- Mississauga's Value Proposition: A review of Mississauga's business climate and strengths/weaknesses of doing business locally;
- Collaboration, Partnerships and Networking: A review of existing collaborative initiatives among cluster stakeholders; and
- Blue Sky: A review of potential initiatives for the City of Mississauga, in conjunction with partners, to undertake in order to support and enhance the local life sciences cluster.

7 Life sciences companies.
8 Sector/business associations, post-secondary institutions, government, incubators and workforce development organizations.

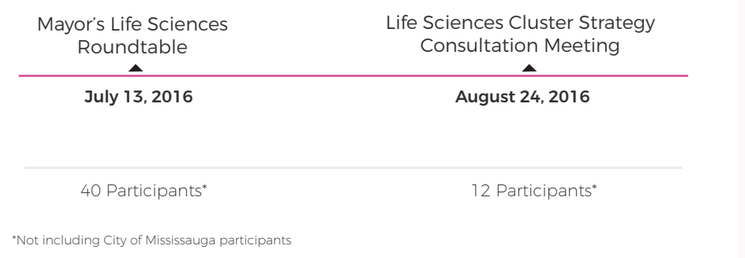
Figure 4: Mississauga Life Sciences Cluster Strategy Stakeholder Phase One Consultation Process

Phase Two

The 2016 Mayor's Life Sciences Roundtable session was held on July 13, 2016 at the Living Arts Centre in Mississauga bringing together 40 life sciences stakeholders, comprising industry, post-secondary institutions, government, incubators, chambers of commerce, and sector association leaders. A review of the progress of the Strategy was shared with roundtable participants, and an engaging discussion was facilitated to develop a shared vision and goals for the Strategy.

A second roundtable session was held on August 24, 2016. This follow-up allowed participants to confirm the final Mississauga life sciences cluster vision and prioritize strategic options for the final Strategy, based on pre-determined prioritization criteria (See Appendix D for strategy prioritization criteria).

Figure 5: Mississauga Life Sciences Cluster Strategy Stakeholder Phase Two Consultation Process



INTERNAL PROJECT TEAM WORKING SESSIONS

While the outcomes of the Strategy represent a stakeholder-driven initiative, the internal project team[9] worked collectively to lead the project management and development of the Strategy. In addition to project management tasks and day-to-day Strategy development responsibilities, internal project team brainstorming sessions were also undertaken and were divided across two project phases.

Phase One

The internal project team collectively completed a SWOT assessment to summarize the internal (strengths, weaknesses) and external factors and trends (opportunities and threats) impacting Mississauga's life sciences cluster. The internal project team identified a list of 127 separate strategic options to address the challenges and opportunities identified in the SWOT assessment.

Table 3: High-Level Mississauga Life Sciences Cluster SWOT Matrix

	Strengths	Weaknesses
Internal Cluster Elements	Talent and labour force Collaboration, partnerships and networking Leadership and governance model Access to innovation Physical infrastructure and real estate Branding and marketing Value chain Funding Business climate	

	Opportunities	Threats
External/ Global Market Trends	Aging population Global talent shortages Increased merger & acquisition activity The changing landscape of global innovation Capitalize on emerging opportunities Intellectual property standards: patent cliff and generic drug competition Regulatory landscape Increasing healthcare demands Convergence of life sciences and ICT Rising real estate costs through global jurisdictions	

Phase Two

Following the 2016 Mayor's Life Sciences Roundtable session, the internal project team held a number of brainstorming sessions to:

- Link the strategic options to the shared vision;
- Develop a final strategic framework (see Appendix C); and
- Develop strategy prioritization criteria to assess the strategic options and develop final actions.

After the follow-up roundtable session held in August 2016, the voting results of the strategic options were reviewed and prioritized into a final list. These actions were reviewed with both internal and external partners to ensure buy-in and commitment from partners. For each action item, timing, roles and key performance indicators (KPIs) were identified to ensure that the final Strategy is feasible.

9 City of Mississauga staff from the Economic Development Office and Business Improvement section

APPENDIX B

OUR PARTNERS

The Mississauga Life Sciences Strategy represents a collective community-based strategy intended to create mutual benefits for all stakeholders. The City of Mississauga Economic Development Office would like to thank our partners and cluster stakeholders for their ongoing support in both the development and implementation of the Strategy. These stakeholders include the following:

Non-Industry Stakeholders:

Associations:
- BioTalent
- BIOTECanada
- Innovative Medicine Canada (IMC)
- Life Sciences Ontario (LSO)
- MEDEC
- Mississauga Board of Trade (MBOT)
- Ontario Bioscience Innovation Organization (OBIO)

Provincial Government:
- Ministry of Economic Development and Growth
- Ministry of Research, Innovation and Science

Hospitals:
- Trillium Health Partners

Incubators and Research Institutions:
- MaRS Discovery District
- Research, Innovation, Commercialization (RIC) Centre

Post-Secondary Institutions:
- Queens University
- Seneca College
- Sheridan Institute of Technology and Advanced Learning
- University of Guelph
- University of Toronto Mississauga

Regional Marketing Associations:
- TO Health!
- Toronto Global

Industry Stakeholders:

- Alcon Canada Inc.
- Alphora Research Inc.
- Amgen Canada Inc.
- ApoLab
- ArrowCan Partners Inc.
- Bank of Montreal Life Sciences Division
- Bayer Inc.
- Baylis Medical Company
- Bayshore Healthcare Ltd.
- Biogen Canada
- BioIntegral Surgical, Inc.
- Boston Scientific
- CannScience Innovations
- Celgene Inc.
- Chemi Pharmaceutical Inc.
- Contex International Technology (Canada) Inc.
- Contract Pharmaceuticals Ltd.
- EMD Serono Canada Inc.
- EUROIMMUN Medical Diagnostics Canada Inc.
- Exova Canada Inc.
- Genzyme Canada Inc.
- Gilead Sciences Canada Inc.
- GlaxoSmithKline Inc.
- Inflamax Research Inc.
- Intertek Cantox
- Intrinsik Health Sciences
- Ipsen Biopharmaceuticals Canada Inc.
- J-Squared Technologies Inc.
- Kuehne + Nagel Life Sciences Division
- McKesson Canada
- Meda Pharmaceuticals
- Mint Pharmaceuticals Inc.
- MyndTec Inc.
- Novadaq Technologies Inc.
- Orthocan Orthopaedics Inc.
- Patheon Inc.
- Paul Lucas Consulting
- PointClickCare
- Profound Medical
- ProlucidTechnologies Inc.
- RMF Design and Manufacturing Inc.
- Red Leaf Medical Inc.
- Roche
- SGS Canada Inc.
- Scientific Insights Consulting Group Inc.
- Stratford Managers Corporation
- Sunovion Pharmaceuticals Canada
- Syng Pharma
- Sysmex Canada Inc.
- Talon Pharmaceuticals
- Teva
- Therapure Biopharma
- Other anonymous life sciences companies through the online survey

APPENDIX C

STRATEGIC FRAMEWORK

During the Mayor's Life Sciences Roundtable (held July 13, 2016), seven shared vision items were collaboratively developed. These goals largely reflected the Strategic Principles developed during Phase One of the project. The shared vision items were subsequently linked with the respective Strategic Principles to start to develop the Guiding Principles and goals. Strategic options prioritized during the August 24th follow-up roundtable session, subsequently became the final actions – the foreseeable outcomes from each of the final actions were then developed into objectives for each of the identified goals.

Figure 6: Mississauga Life Sciences Cluster Strategic Planning Framework

Phase One and Two Strategic Organization		Mississauga Life Sciences Cluster Strategic Framework
Strategic Principles	▶	Guiding Principles
Shared Vision Items (Mayor's Life Sciences Roundtable)	▶	Goals
Outcomes/Phase One Strategic Principle Descriptions	▶	Objectives
Strategic Options	▶	Actions

APPENDIX D

STRATEGY PRIORITIZATION CRITERIA

Roundtable participants were asked to review the strategic options and select the ones that best answered the following prioritization criteria to ensure that the final actions were readily implementable, yet made the most impact for Mississauga's life sciences cluster.

Table 4: Strategy Prioritization Criteria

Prioritization Criteria	Weighting Factor
Strategic Alignment: How well does the action align with the strategic vision? (e.g. City of Mississauga Strategic Plan, EDO Strategy, shared life sciences vision)	30%
Return on Investment: How favourable/big is the net benefit of this action? (i.e. Benefits relative to the costs)	25%
Integration in the Big Picture: Does the action add new and meaningful value to the existing life sciences ecosystem? (i.e. Is this action new and meaningful or is it a duplication of services?)	20%
Readily Achievable: Is the action relatively feasible to implement in terms of the amount of necessary resources, nature of the work and required time? (i.e. Is this action easy or complex to implement?)	15%
Reliance on External Market Factors: Does the implementation of the action remain in the direct control of the City of Mississauga and cluster stakeholders? (i.e. Are there external/global market trends and factors that directly impact this action that also remain outside of the realm of control of the partners who are directed with implementing the action?)	10%

APPENDIX E

IDENTIFIED LEADS, PARTNERS & KEY PERFORMANCE INDICATORS

The Action Plan details specific stakeholders who will lead and support the implementation of each action item. The Action Plan remains flexible in order to adapt to emerging economic trends and organizational shifts and realignments. As such, the list of identified stakeholders is not exclusive and may change over the course of the Strategy timeframe.

The following table provides an overview of the list of acronyms/abbreviated text used to describe stakeholders identified as leads and/or supports in the Action Plan.

Table 5: Stakeholder Abbreviations

STAKEHOLDERS	ACRONYM/ABBREVIATION
Export Development Canada	EDC
City of Mississauga Economic Development Office	EDO
City of Mississauga Policy Planning Division – Information Planning	Information Planning
Life Sciences Ontario	LSO
Mississauga Board of Trade	MBOT
Mississauga International Partnership Program committee	MIPP
National Research Council Canada	NRCC
Ontario Bioscience Economic Strategy Team	OBEST
Ontario Bioscience Innovation Organization	OBIO
Ontario Centres of Excellence	OCE
City of Mississauga Planning & Building	Planning & Building
Research Innovation Commercialization Centre	RICC
Sheridan Institute of Technology and Advanced Learning	Sheridan
City of Mississauga Transportation & Works	T&W
Toronto Transit Commission	TTC
University of Toronto Mississauga	UTM

KEY PERFORMANCE INDICATORS

The identified key performance indicators (KPIs) represent integrated measures that track the progress of each of the four guiding principles. KPIs for each guiding principle will be reviewed collectively in order to deliver a holistic measure of success.

MISSISSAUGA

ECONOMIC DEVELOPMENT OFFICE

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