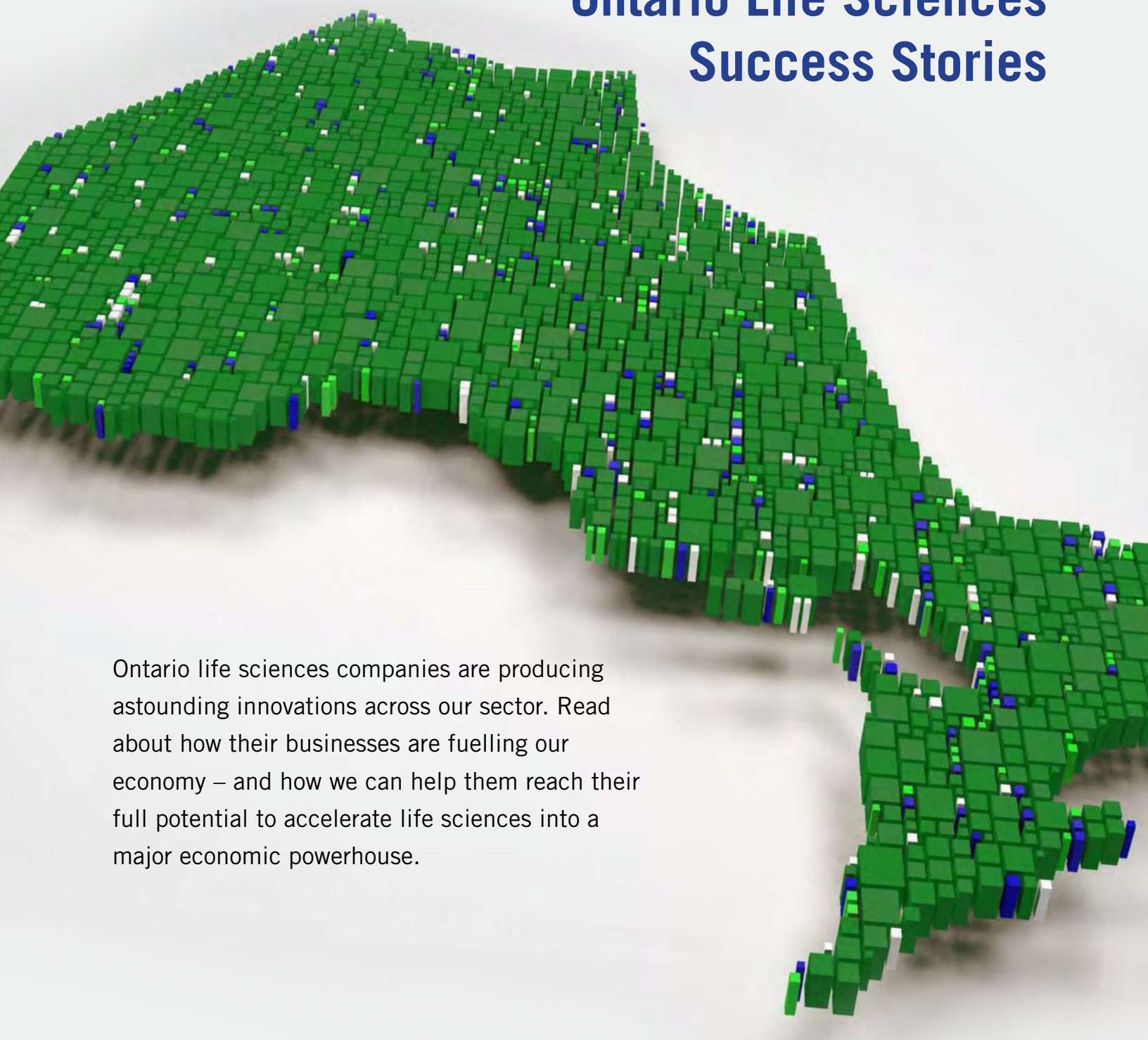




Ontario Life Sciences Success Stories

Ontario life sciences companies are producing astounding innovations across our sector. Read about how their businesses are fuelling our economy – and how we can help them reach their full potential to accelerate life sciences into a major economic powerhouse.





Success Stories

Cheelcare.....	2
Cochlear Canada.....	3
Cynapsus Therapeutics	4
ForaHealthyMe.....	5
Gilead Sciences.....	6
GlaxoSmithKline.....	7
Green Table Foods.....	8
Katan Kitchens.....	9
Merck Canada.....	10
P&P Optica.....	11
Proteins Easy.....	12
Proteocyte AI.....	13
Reliq Health Technologies.....	14
Synaptive Medical.....	15
Turnstone Biologics.....	16
Vive Crop Protection.....	17





exceed your reach

Cheelcare

www.cheelcare.com

Richmond Hill

Markets:

Canada; US (1st stage);

Europe (2nd stage)

Cheelcare has created a line of multifunctional assistive mobility devices, vastly improving upon power wheelchairs currently on the market. The traditional wheelchair’s mechanical design has many limitations, forcing the user to acquire multiple assistive devices to perform daily activities, and still many activities such as picking up dropped objects or reaching high shelves are hard to achieve.

Cheelcare’s proprietary technology allows users to position their bodies at multiple angles and heights, allowing them to perform daily activities independently or with minimal assistance – with unparalleled functionality, comfort, safety, and dignity.



Milestones: In less than three years since the company’s inception, Cheelcare completed a total of eight complex prototypes. The company’s current prototype is in pre-production and represents a complete solution that truly reflects the company’s vision.

Barriers to success: Market penetration is difficult; the industry is reluctant to invest in new technologies due to layers of bureaucracy, and manufacturers have no real incentive to re-imagine the experience of wheelchair users.

Meanwhile, the current certification structure divides device functionality, parts, and options into separate components, and is not conducive to more complex, integrated solutions.



Hear now. And always

Cochlear Canada

www.cochlear.com

Toronto

Markets:

Worldwide

Cochlear Canada is an incorporation of Cochlear Limited, a global medical device leader in designing and manufacturing implantable hearing devices, including cochlear implants. A cochlear implant is a surgically implanted prosthetic device that restores hearing to a person with severe to profound hearing loss. The company's hearing implants have helped more than 500,000 people around the world hear.

To continue its innovative status, Cochlear invests more than US \$160 million each year in R&D and currently participates in more than 100 collaborative research programs worldwide.



Milestones: In 2018, the company introduced the world's first and only smartphone compatible cochlear implant sound processor. This allows recipients to stream music, videos, and phone calls directly to their sound processor in a wireless manner. Cochlear also pledged US \$10 million over 10 years to the Johns Hopkins Bloomberg School of Public Health to establish the 'Cochlear Center for Hearing and Public Health'. The Center will be the first of its kind to address hearing loss as a global public health priority. Cochlear encourages alternative models for delivering hearing care in growing economies to provide lower cost access.

Barriers to success: Awareness about hearing loss and treatment options is the company's biggest challenge, globally and in Canada. Fewer than five percent of people who could benefit from an implantable hearing solution are currently being treated. Access to cochlear implantation is also a challenge for patients. In Ontario – with very limited public funds being available for cochlear implantation – patients have to wait in line for many years to receive the device through surgery.



CYNAPSUS

Cynapsus Therapeutics Inc.
Toronto

Markets:
Worldwide

Cynapsus Therapeutics has developed and commercialized a reformulation of an approved drug to improve its use for millions of Parkinson’s patients worldwide, decreasing need for patients to be institutionalized, and positively impacting their caregivers. Over one million people in the United States and an estimated 5 million people globally suffer from Parkinson’s disease, and its prevalence is increasing with the aging of the population.

Based on the IMPACT Registry Study and the results of Cynapsus’ Global 500 Neurologists Survey, it is estimated that between 25 percent and 50 percent of patients experience “off” episodes in which they have impaired movement or speaking capabilities. Current medications only control the disease’s symptoms, and most drugs become less effective over time as the disease progresses.



Milestones: Cynapsus was acquired at the end of 2016 for \$841 million CAD – one of the largest Canadian acquisitions in the past 10 years. This was a competitive process with multiple bidders from around the world; the Japanese buyer retained Canadian and Ontario presence and is currently expanding.

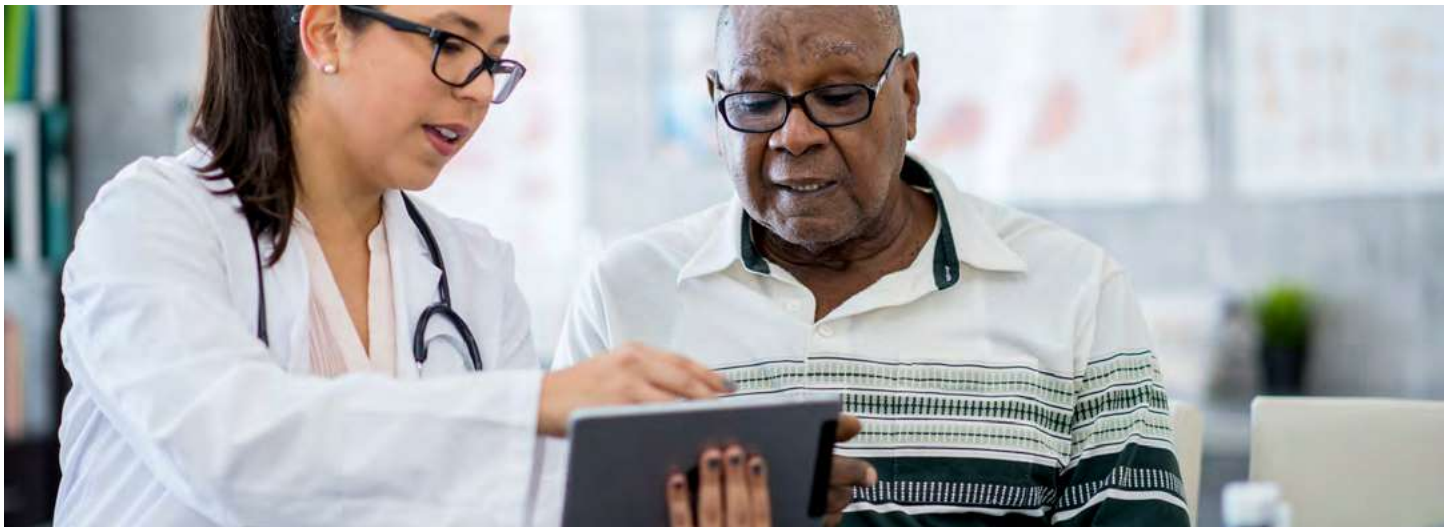
Barriers to success: Lack of early stage capital; length of time to gain visas for professional foreign hires.

forahealthy^{me}

ForaHealthyMe Inc.
www.forahealthy.com
Markham

Markets:
Canada; US; Netherlands;
Asia

The ForaHealthyMe Inc. solution is a low cost, easy to use virtual-care platform to extend care beyond the walls of treatment centers. The platform delivers a unique combination of computer vision, telehealth, health informatics, and patient/provider virtual care solutions to manage patients during the pre-op and rehabilitation phases of care, allowing healthcare and community sector providers to support patients at home. Health providers can remotely prescribe an exercise routine, adjust treatment to support rehabilitation, and gather range-of-motion data for analysis. Clinic visits can be time consuming, costly, and impractical, especially for patients residing in rural areas. The company's technology optimizes limited health resources and service utilization to reduce readmission rates and improve patient health outcomes.



Milestones: With support and funding from the Health Ecosphere Project and York University, the company successfully tested the reliability and performance of its system via a human research project. Researchers assessed how accurately the ForaHealthyMe Inc. motion capture system measures joint angles during human movement versus a gold standard motion capture system; they concluded ForaHealthyMe's system showed 'good to excellent' reliability.

Barriers to success: The biggest barriers to adoption of health technologies is the lack of clear procurement programs, the inability of providers and administrators to agree on strategy, and the inertia that besets providers of a publicly-funded health care system. Health systems in Canada are not incentivized to adopt new technology.

Many healthcare institutions still manage patient care with systems and workflows that are outdated. Regular staff turnover and the lack of clarity on procurement issues result in extremely lengthy sales cycles.





Gilead Sciences, Inc.

www.gilead.com

Mississauga

Markets:

Gilead Sciences operates in over 30 countries worldwide. Gilead Sciences Canada has been established in Ontario since 2006.

Gilead is a research-based biopharmaceutical company that discovers, develops, and commercializes innovative therapeutics in areas of unmet medical need. Over the past 30 years, Gilead scientists have contributed to significant advances in areas of high public health impact, such as the treatment and prevention of HIV/AIDS, the treatment of influenza, hepatitis B and C, and other infectious diseases.

Gilead is leading in scientific developments of new therapeutics, including novel cell therapy technologies which have the potential to further transform cancer care. Gilead's Canadian process and research facility located in Edmonton manufactures active pharmaceutical ingredients (APIs) for the company's investigational compounds as well as for some commercial products, and provides technology transfer and support to Gilead's commercial API manufacturing sites and partners around the world. Gilead also leverages contract manufacturing capabilities to serve both local and global production. Fully one third of worldwide Gilead tablet requirements are produced in Ontario.



Milestones: Gilead has helped revolutionize the treatment of chronic hepatitis C virus (HCV) infection, developing innovative anti-viral (DAA) therapies that offer cure rates as high as 95-99% across all genotypes (1-6) of HCV infection, with shorter treatment duration and higher tolerability versus prior regimens. These new DAAs help avoid serious impacts associated with HCV – including liver fibrosis, liver transplant, liver cancer, and death.

The company is also leading the development of innovative engineered cell therapies that empower the immune system's ability to recognize and kill tumours. Gilead recently received approval for the first chimeric antigen receptor T-Cell (CAR-T) therapy for the treatment of aggressive lymphoma in the US.

Barriers to success: High business uncertainty and risk with the regulatory changes proposed as part of the Patented Medicine Prices Review Board (PMPRB) modernization; lengthening and uncertain time frames to public reimbursement.



GlaxoSmithKline

ca.gsk.com
Mississauga

Markets:
Global

GlaxoSmithKline (GSK) is a global healthcare leader engaged in developing, manufacturing, and marketing pharmaceutical products including vaccines, over the counter medicines, and health-related consumer products. Its Canadian head office is located in Mississauga.

Milestones: GSK has a longstanding presence in Mississauga with a sizeable footprint in the local business community. The company continues to invest in its Mississauga global manufacturing site. This includes a new \$36 million investment, announced in September 2018, that will serve to strengthen its position as a world-class manufacturing site to produce the company's Voltaren® brand products for export.

The site currently produces approximately 50 different products, exporting 90% to more than 100 markets worldwide. As a result of the investment, the facility is well positioned to build on its established strengths in the production of complex prescription products with an expanded portfolio of higher volume consumer healthcare products, growing the site's production capacity from 30 million units a year to almost 50 million units by 2020.





Green Table Foods Inc.
www.greentablefoods.com
Guelph

Markets:
Canada; US; EU; Asia

Guelph-based Green Table Foods is Canada’s premier formulator and manufacturer of certified organic plant-based probiotic foods. The company has developed a full line of retail-ready fermented vegetable products focused on Canadian agri-food inputs. This line of nutrient dense products is distributed nation-wide to more than a thousand retailers; the company also provides private label manufacturing for a growing list of Canada’s top tier grocers, restaurant chains, and food service companies. Green Table Foods has remained a family-owned business since being founded by Caroline Pilon and Josh Whitehead in 2004.



Milestones: Green Table Foods achieved Organic Certification in 2007, and became federally registered as a processor with the CFIA in 2009. The company began shipping out of province in 2010. In 2015, Green Table Foods won the City of Guelph’s Innovation Award for sophistication of fermentation technologies. In 2017, the company was a finalist in the Premier’s Award for Agri-Food Innovation, and in 2018 won the Grand Prize for best new product in the Ontario Fermentation Awards.

Barriers to success: Financing.



Katan Kitchens

quinta.ca

Rockwood

Markets:

100% Domestic

Katan Kitchens strives to be the global leader in high quality, locally produced and processed superfoods. The company incorporates best practices that focus on providing consumers with natural, highly nutritional superfoods. Katan Kitchens is focused on developing the value chain and sales of their high quality, local, non-GMO Ontario quinoa seed, Quinta Quinoa. Katan is the first to bring an Ontario grown and processed quinoa product to the market; it is also the only quinoa on the market that has performed the necessary analyses to support its nutritional claims. It has been developed through six years of natural breeding and in the pursuit of developing a variety that is conducive to Canada's climate and soil conditions.



Milestones: Since its launch, Quinta has expanded into 100+ retail locations across Ontario and is available on Amazon.ca. The company has raised more than \$2 million in non-repayable grants and has received recognition from the Premier's Award for Agri-Food Innovation Excellence (Regional); Ontario Farm Fresh Market Association Food Innovation Award; Ernst & Young Regional Entrepreneur; SIAL Canada's Top 10 Food Innovation Award, and Nutraingredients International Startup of the Year.

Barriers to success: The company's biggest hurdle is gaining awareness amongst its target population. Its target market are the 10-15% of consumers who seek out higher quality, higher nutrient local foods. This market is crowded, making marketing and education a time-consuming and expensive task.



Merck Canada

www.merck.ca

Toronto; Quebec

Markets:

Global

Merck Canada Inc. is the subsidiary of Merck & Co., a leading global biopharmaceutical company committed to improving health and wellbeing. Merck employs nearly 800 people across Canada. Merck offers more than 250 vaccines, innovative medicines, biosimilars, and animal health products. It is a leader in many therapeutic areas, including cardiology, infectious diseases, respiratory conditions, oncology, diabetes, virology, and women's health. The company is one of the top R&D investors in Canada, with investments totalling more than \$1 billion since 2000. Today, Merck is developing medicines and vaccines to address urgent health challenges, including cancer, cardio-metabolic diseases, Alzheimer's disease, and infectious diseases like HIV and Ebola.



Milestones: Merck is currently investing in 116 clinical trials involving over 400 sites and more than 1,800 patients across Canada, including 90 studies at 115 centres in Ontario. Clinical trials allow Canada's world-leading specialists to take part in cutting-edge research while helping Canadian patients. Merck's immuno-oncology therapy is an excellent example: Nearly 600 Ontarians were enrolled in clinical trials for this treatment since 2012 and Canada was also one of the first launch countries for this important innovation. Merck also provided Canadians with the first HPV vaccine to help prevent cervical and other HPV related cancers for both males and females. Young Canadians are now being vaccinated routinely to help protect them from this virus and the potentially deadly cancers it causes.

Barriers to success: Proposed changes by the federal government to how the Patented Medicine Prices Review Board (PMPRB) assesses drug prices will have serious negative consequences on Canada and Ontario's economic competitiveness in medical and biopharmaceutical research and patient access to innovative medicines. These amendments will reduce research investments and lead to the loss of high quality jobs in this sector in Ontario and Canada. To date, Canada has benefited from "Tier 1" status, meaning Canadians are among the first in the world to access new medicines. The proposed changes will jeopardize this status. The long and restrictive review process to achieve reimbursement by public drug plans is another key issue of concern. A 2016 report found that Canada ranked 18th of 20 countries with only 37% of new medicines receiving public reimbursement across the country; Canada was also among the slowest to reimburse, ranking 15th of 20 countries.



P&P Optica Inc.

ppo.ca
Waterloo

Markets:

Worldwide with initial focus on North America

P&P Optica has developed a smart imaging solution for unprecedented visibility in food manufacturing, enabling companies to produce better and safer food. Its PPO Smart Imaging System offers a complete, end-to-end method for improving companies' bottom line through foreign material detection, quality analysis, and inline grading. The company also uses AI algorithms to provide analysis on many aspects of the food manufacturing process.

P&P's technology allows companies to optimize revenue by determining premium product, thereby reducing waste and mitigating costly recalls; monitor food production inline, in real-time; simultaneously detect multiple foreign objects with one system providing the ability to diagnose and resolve failure points; and accurately and automatically identify product quality (protein, water, fat content, marbling, and more).



Milestones: P&P Optica implemented three paid pilot systems at Canadian food processing companies, which are now moving toward commercialized solutions. The company recently installed its PPO Smart Imaging System at Conestoga College's Institute for Food Processing Technology, a major industry hub.

Barriers to success: Raising equity, especially within Canada. The company finds US VCs and private equity firms are more interested in its offering, and less risk averse over their Canadian counterparts. Software talent is also at a premium in Canada due to a drain from large multinationals (i.e. Google, Microsoft), making it difficult for smaller companies to find the right people at a fair price.



Proteins Easy Corp.

www.proteinseasy.com

Ottawa

Markets:

Canada; US; India; Australia

Proteins Easy Corp. (PEC) is a spinout from Ottawa U that has developed patented and proprietary processes that turn plants into miniature protein factories. This technology can direct corn, wheat or peas to manufacture economically valuable proteins for pharmaceuticals, processing aids, food ingredients, dietary supplements, and more.

These proteins are stable for years when stored in-seed, at room temperature. The company is currently altering rice plants to produce a natural enzyme used in the food industry as a processing aid.



Milestones: Partnering with the largest seed company in India to further its protein “pharming” efforts; working with industrial partners in India and Europe to create region-specific solutions in food and agriculture that have the potential to create better, healthier foods, and solutions for greener and more efficient crop protection. Proteins Easy Corp. is the industrial partner in Ontario’s LCIF project to reduce greenhouse gases in agriculture and improve fertilizer efficiencies.

Barriers to success: There are challenges to funding new and emerging companies in Canada. The availability of investors is limited; Proteins Easy has luckily been able to take advantage of several provincial and federal programs to supplement investment with grants. Finding and hiring skilled scientists also presents a challenge; often the process will stretch to months.





Proteocyte AI

proteocyteai.com

Toronto

Markets:

Canada; US

Proteocyte AI, a Toronto-based company, is developing a platform technology to accurately predict the risk of developing certain types of cancers. Their first product, Straticyte™, is a novel precancer test that predicts the risk of developing oral cancer over a five-year period.

Oral cancer has a five-year survival rate of only 50%, killing one person every hour in North America; more than 70% of oral cancers are not diagnosed until a very late stage. By identifying and treating oral cancer before it happens, Proteocyte's tests help save lives and reduce healthcare costs.



Milestones: Proteocyte AI has raised \$4 million since 2011; its first peer-reviewed clinical paper was published in March 2017. Reference sites have increased to include Toronto, Ottawa, Montreal, Edmonton, and Calgary. US sites are currently submitting biopsies from New York, California, and New Jersey, with clinical research projects initiated in Maryland, Alabama, and New York.

Barriers to success: Raising the required funds to commercialize Straticyte remains Proteocyte's greatest barrier to success. Capital will enable Straticyte to complete its regulatory process, economic modelling, and commercial launch.



Reliq Health Technologies, Inc.

reliqhealth.com

Hamilton; Vancouver

Markets:

Canada; US; Europe;

Australia

Reliq Health provides innovative, cost effective healthcare technology solutions for remote patient monitoring, telemedicine, and care collaboration to the community healthcare market. The company’s iUGO Care platform was specifically designed to provide high-quality virtual healthcare to chronic disease patients. These patients make up 15-20% of the total population, and yet they account for 80% of all healthcare spending in developed nations. These patients are largely responsible for their own care in the home, but as a group they have not been effective at managing their chronic diseases; less than 50% of chronic disease patients take their medications as prescribed. Reliq’s automated in-home virtual assistant provides coaching, education, reminders, and alerts to help patients proactively manage their chronic diseases and improve health outcomes.



Milestones: Reliq Health acquired iUGO Care in February 2016 for \$2 million in stock. In November 2017, the company closed a \$5 million financing. Reliq expects revenues of >\$20M in 2018 based on current contracts, with 95% of revenues coming from its US customers.

Barriers to success: Access to capital was initially a challenge for the company, but is no longer an issue now that it has secured key US contracts. The US market remains the company’s primary focus as the Canadian healthcare market is slow to adopt new healthcare technologies. Reliq is committed to working with government to improve access to care and health outcomes (and by extension, reduce healthcare costs) for remote and rural populations across Canada.

synaptive

Synaptive Medical Inc.

www.synaptivemedical.com

Toronto

Markets:

US; Canada; Europe

South East Asia; Australia

Synaptive Medical Inc. creates medical devices and technology for neurosurgeons and hospitals to improve outcomes for patients. The company's advanced imaging and visualization tools feature a user-centric connected experience, allowing doctors to bring patients precisely the right treatment at the right time.

Synaptive collaborates with leading clinicians and healthcare systems to integrate its products and services across traditional barriers and information silos that limit the effectiveness of care, both in and beyond the operating room.



Milestones: Synaptive signed a key partnership with General Atlantic in Fall 2016, and completed a second successful fundraising round in Summer 2017. Modus V™, the company's second generation digital robotic visualization system, is now globally available.

Barriers to success: Synaptive's biggest challenge has been driving Canadian market adoption. The complexity of procurement processes within Canadian hospitals creates barriers to acquiring capital equipment, making it harder for physicians to be early adopters.

The Canadian market is often budget-focused, with longer sales cycles than American and European markets. These challenges make Canada difficult for entry in the medtech space, and may stifle innovative technologies emerging on home soil.



Turnstone Biologics

turnstonebio.com

Ottawa

Markets:

Canada; US

Turnstone Biologics is a privately-held immuno-oncology company, developing viral immunotherapies based on oncolytic viruses for treatment of cancer. Its unique two-in-one therapeutic approach combines an oncolytic virus with an antigen-specific cancer vaccine to address the challenges of treating different solid tumors, including non-small-cell lung cancer, breast cancer, and esophageal cancers. Its platform was originally developed as a result of an OICR-funded collaboration amongst The Ottawa Hospital, the Children's Hospital of Eastern Ontario, and McMaster University.



Milestones: Turnstone raised a \$41 million (USD) plus series B round in November 2016, following an \$11.3M (CAD) Series A in October 2015. The company licensed an option on three of their oncolytic viral immunotherapies to AbbVie in Fall 2017. The deal gives AbbVie the chance to add Turnstone's lead MAGEA3 candidate to its pipeline once data from two ongoing phase 1/2 trials are available.

Barriers to success: Completing Phase 2 & 3 regulatory clinical trials; ability to quickly hire R&D and technical staff.



Vive Crop Protection

vivecrop.com

Mississauga

Markets:

Canada; US

Vive Crop Protection makes crop protection products better. This helps farmers produce more high-quality food while improving sustainability and efficiency. The company uses its patented Allosperse Delivery System to precisely target the delivery of trusted pesticides and control how those pesticides behave in the farmer's spray tank, in the soil, in plants and in the environment. Precise targeting means that the pesticides are used more efficiently, helping both farmers and the environment. Farmers can protect their crops from insects and diseases at the same time as they apply fertilizer, saving fuel and labour. The ability to mix pesticide with fertilizer dramatically increases yield, crop quality, and farm productivity, while minimizing environmental impact and costs.



Milestones: Since launching its first products in 2017, Vive have seen rapid adoption across the United States. Its products are now used by farmers harvesting ~300,000 Ha of production, including producers of sugar beets, potatoes, soybeans, corn, alfalfa, and dry beans. The company's sales have tripled year over year and are expected to continue at this rate for 2019. In 2019 the company will launch five new products into the US, and expects to launch its first products in Canada in 2020, subject to approval by Health Canada.

Barriers to success: Due to the seasonal nature of agriculture, Vive's working capital needs tend to be higher than other companies at the same stage. It is difficult to fund these requirements entirely with equity, but debt sources can be difficult to access prior to profitability. The company is starting to pursue the Canadian market, but access to suppliers is significantly more challenging in Canada than in the US. There are large export opportunities for Vive's products outside of the United States and Canada; however, managing these export opportunities for a small, growing business is also difficult.

Blueprint for a Coordinated Ontario Life Sciences Strategy

In November 2017, Life Sciences Ontario (LSO) released its **Blueprint for a Coordinated Ontario Life Sciences Strategy**, laying out a comprehensive plan and recommendations for government and policymakers to accelerate the success of life sciences – Ontario’s largest economic growth opportunity.

LSO’s Blueprint recommends a pan-government strategy with specific action around access to capital, talent growth, support for innovation, and promotion of our sector. The document is endorsed by leading provincial and national life sciences, health, and economic organizations.

As a sector that contributes \$38.5 billion to the province’s GDP and ranks among the top clusters in North America, the economic growth potential for Ontario life sciences is enormous.

Just how big is the opportunity? As of August 2018, the combined market capitalization of only two US biotech companies, Amgen and Gilead, was US \$238 billion, while the entire Canadian mining sector (1,200+ companies on the TSX/TSXV) was US \$231 billion. An Ontario biotech success story has the potential to revolutionize our economy.

A life sciences strategy is also crucial to providing knowledge-based jobs for our highly-educated workforce (more than 55% of Ontarians have a college or university degree, 25% higher than the OECD average), as well as efficient and cost-effective healthcare. The key to harnessing our sector’s success will be well-developed policies that address the challenges of the adoption of innovation, access to risk capital, and supporting commercialization efforts to realize the full potential of our investments in research.

The Blueprint for a Coordinated Ontario Life Sciences Strategy is endorsed by leading provincial and national partner organizations, including: Bioindustrial Innovation Canada; BIOTECCanada; Chemical Institute of Canada; Innovative Medicines Canada; MEDEC, Ontario Agri-Food Technologies; Ontario Chamber of Commerce; and TO Health.

To download the full report visit, <https://bit.ly/2OxbpW3>.



About LSO

LSO is a business-led, member-funded, not-for-profit organization with a legacy of more than 25 years advancing the success of Ontario's life sciences sector. Our customized approach to working with member companies and industry partners allows us to leverage the strengths of the LSO network to commercialize Canadian innovation and technologies, while offering value-added support, services, mentorship, and events.

Mission

LSO's mission is to foster commercial success for the sector through advocacy and education, and promoting the industry locally, nationally, and internationally.



LSO advances our sector's diverse interests by:

Values

- Consultation and collaboration
- Inclusivity and consensus-building
- An aligned voice on key policy matters
- A hub-based approach
- Data-driven decision making
- The equal social and economic benefits of life sciences



Strategic Priorities

1. Raising the profile of Ontario's Life Sciences sector to secure our economic and social prosperity.
2. Advocating for specific public policy action to support our sector's continued growth, such as access to capital, an inclusive and aligned provincial life sciences strategy, and evidence-based decision-making.
3. Delivering unparalleled educational, networking, mentorship, and thought leadership programs to our members.
4. Acting as a centralized hub connecting our sector's diverse clusters to facilitate a strong, aligned life sciences sector with national connectivity.





To learn more about LSO, visit:

www.lifesciencesontario.ca

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