

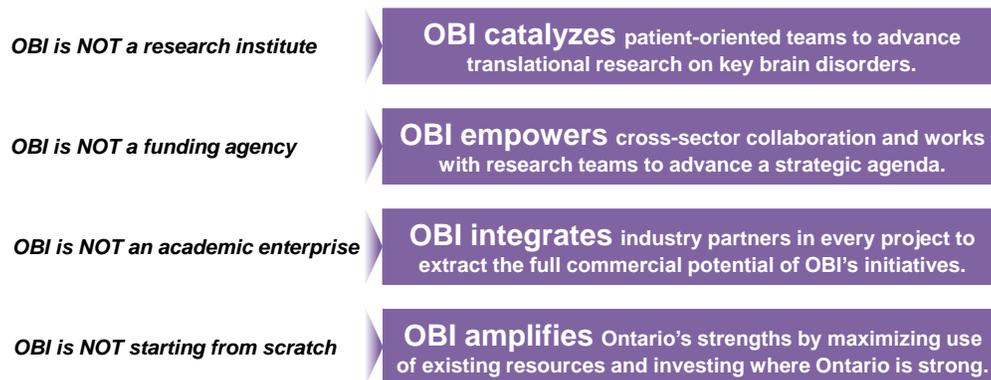
1. Executive Summary

The Ontario Brain Institute (OBI) is driven by a vision to improve brain health and distinguish Ontario as a world leader in patient-centred brain research and innovation.

Transforming Ontario’s system of brain research and innovation

The Ontario Brain Institute (OBI) is a virtual research institute dedicated to improving brain health. By catalyzing an integrated, pan-Ontario system to translate research into care and embed commercialization into research, OBI is maximizing Ontario’s excellence in brain science and clinical care. Recognizing the rising prevalence and mounting economic burden of brain disorders, OBI aims to harness Ontario’s impressive strengths in brain research and medicine to achieve health and economic impact for Ontarians. Ontario has made significant investments in the infrastructure, training and talent needed to conduct world-class translational brain research. Fueled by globally distinguished strength in basic research, OBI is leading a collaborative approach to discovery that helps scientists, clinicians, industry and patient communities leverage Ontario’s resources to fulfill the healthcare and commercial potential of an integrated system of research. While rooted in Ontario and focused on advancing research, development and commercial opportunities within the province, OBI is decidedly outward-looking, pursuing national and international partnerships that enhance Ontario’s stature as a world leader in brain research.

OBI is implementing and coordinating an Innovation System, an integrated group of strategic initiatives designed to support collaboration among the province’s—and the world’s—top brain researchers, clinicians, businesses and patient advocacy groups. By implementing the Innovation System, our aim is to catalyze transformative research, translate discovery into better and more efficient care for patients, drive promising technologies, inventions and innovation to market, and ensure that Ontario achieves the social and economic potential of its neurocluster. A few characteristics define OBI’s competitive advantage and underpin its value to patients, researchers and the life sciences industry:



This approach allows OBI to be operationally lean and strategically focused, building momentum around the commercialization of Ontario’s greatest neuroscience discoveries, delivering social and economic returns on Ontario’s past investments and current resources, and maintaining a focus on the most urgent needs of Ontarians with brain disorders and disabilities.

By catalyzing a new model of integrated discovery oriented around patients and focused on harnessing translational and commercial opportunities, the Ontario Brain Institute is capturing the value of Ontario’s past investments in research, strengthening the competitiveness of Ontario’s neurocluster, and delivering healthcare benefits for patients and the province.



Catalyzing the growth of a vibrant neurocluster in Ontario

The Ontario Brain Institute works by making connections, linking basic and clinical researchers with patients, their care providers and the companies that will turn medical discoveries into jobs, economic growth and better brain health. OBI has carefully examined Ontario's strengths and is systematically assembling the networks needed to galvanize its Innovation System. As described below, the Innovation System advances initiatives that support translational research, data mining and management, collaboration with industry and creation of training and entrepreneurship opportunities in order to help Ontario's hub of excellence in neuroscience deliver greater health and commercial impact. With a view to making Ontario a global address for brain research and innovation, OBI is focused on engaging patients and clinicians more actively in Ontario's research to accelerate the translation of innovation to the clinic; empowering cross-sector collaboration; capturing the innovative potential of multidisciplinary teams; amplifying and sustaining industry's contribution to research and commercialization; and harnessing the value of past investments in people and infrastructure by fostering knowledge exchange and resource-sharing among researchers, patient communities, clinicians and industry. To this end, OBI's Innovation System is built on four pillars:

● **Pillar 1: High-impact translational programs.** OBI is committed to catalyzing multidisciplinary, patient-centred research teams focused on the most critical challenges to brain health in Ontario and beyond. Highly collaborative teams are fundamental to the success of this research system, which strives to apply the approaches and knowledge of multiple fields to build a more comprehensive understanding of brain disorders. OBI's Scientific Advisory Council (SAC) and Industry Advisory Council (IAC) are instrumental in achieving these objectives. As active partners in the development of OBI's programs, they offer expert leadership to research teams, shepherding effective programs and breaking-down silos. OBI has initiated programs on neurodevelopmental disorders, cerebral palsy and epilepsy and has four other cross-disciplinary programs under development (neurodegeneration, traumatic brain injury, depression and addiction). To date, active programs have created over 40 jobs, assembled 78 collaborators from academic, clinical, industry and patient advocacy groups, and capitalized on \$144M of past public investment in infrastructure, equipment and training.

● **Pillar 2: Centralized patient information systems.** OBI is building a powerful informatics platform, Brain-CODE, to standardize, collect and store research data gathered through OBI's translational research programs. Among the first databases of this kind in the world and one that adheres to the highest privacy standards, Brain-CODE will permit discovery of important phenotypic relationships, help to generate new hypotheses and enable analysis that could identify underlying causes or new targets for early detection and treatment. Further, OBI is actively seeking opportunities to increase the analytical power of Brain-CODE by linking with other provincial, national or international databases. Building on over \$200M of past investments in high-performance computing, Brain-CODE is a platform for knowledge exchange and, through its large registry of well-characterized patients, will attract clinical trials to Ontario.

● **Pillar 3: Mechanisms to engage and support industry.** Encouraging early and active industry partnership is one of the best ways to get promising technologies to markets and patients faster. OBI integrates industry players in research from program inception and benefits from the guidance of the 13 industry leaders who sit on OBI's Industry Advisory Committee. OBI has received an \$11M investment from the Federal Economic Development Agency (FedDev) for Southern Ontario, which is supporting projects focused on developing promising technologies with quick-to-market strategies. These projects are expected to yield 8 neurotechnology devices, 4 brain training software packages and 2 brain sensing enhancements, and are forecasted to create over 400 positions for HQP in the next 3-5 years.



● **Pillar 4: Training and entrepreneurship.** A comprehensive approach to building Ontario's neurocluster must ensure that the province has the human resource capacity and skills to support and sustain cluster growth. To date, three programs have been developed under the Experiential Education Initiative: OBI Entrepreneurs Program (awards to support researchers in developing new products/companies to address issues in neuroscience); OBI Graduate Opportunities - Internships (industry placements for neuroscientists); and OBI Graduate Opportunities - Management Fellowships (business and management skills development). Capitalizing on the diverse resources that exist within Ontario's many innovation centres and incubators, these programs are empowering neuroscientists with the skills to carve out non-academic careers in their field of expertise.

Sustaining Ontario's leadership in brain research and innovation

Tackling brain disorders is a critical first phase of OBI's innovation system. However, brain health is not simply about prevention and treatment of disease; it is about supporting and maintaining normal development and optimizing how we use our brain early in life and as we age to optimize performance. Therefore, beyond an initial focus on **Disorders of Brain Functioning**, OBI envisions two future phases of research: **Understanding Normal Brain Functioning** and **Optimizing Brain Performance**.

Each of these phases will deliver distinct benefits for Ontarians. Initiatives that focus on the disordered brain will deliver technologies, treatments and interventions to prevent and manage some of the most significant brain disorders in Ontario. Studying normal brain function across the human lifespan will yield strategies for early (pre-symptomatic) detection of potential disorders and the maintenance of brain health. A focus on enhancing brain performance will drive the development and implementation of innovative approaches to education and training that optimize the ability of Ontario's citizens to learn, think and perform, realizing the full potential of Ontario's students and workforce.

Achieving impact for Ontarians

OBI will achieve impact for Ontarians and the world through a steadfast commitment to harnessing the value of brain research to transform clinical care, build a thriving neurocluster and improve how we learn and develop across our lifespan.

● **Individual-centred Research.** Through interdisciplinary teams and strategically selected research initiatives centred around the brain disorders Ontarians face, OBI will be setting a new standard for translational, collaborative research that makes the individual both the source and beneficiary of transformative insights into brain function.

● **Health Impact.** With research programs initially centred around brain disorders, then expanding to normal brain development and eventually optimizing brain performance, OBI's collaborative teams will advance the technologies, interventions and lifestyle strategies that will minimize the burden of brain disorders, accelerate recovery, improve prevention and maximize potential.

● **Economic Results.** OBI's translational research program is industry-driven and has already delivered measurable economic results for Ontario by creating knowledge-based jobs, supporting new companies and fostering entrepreneurial and managerial talent. As OBI continues to encourage research that builds a validated pipeline of new technologies, products and devices, OBI will strengthen Ontario's knowledge-based economy and fuel industry growth.

● **Performance Optimization.** Knowledge of brain disorders and normal development will drive breakthroughs in how we train the brain, manage development and realize human potential. OBI will foster the integration of neuroscience into the development of educational tools



and practices, development activities customized to the unique needs of the brain as it changes across the lifespan and strategies for optimizing human performance. OBI's ultimate goal is to translate research into tools and techniques for improving brain performance and equipping Ontarians with the ability to enrich their contribution to society.

OBI is advancing a remarkably multidimensional and unique mandate that addresses a need for a catalyst and coordinator of Ontario's spectacular concentration of research institutes, hospitals, universities and companies that conduct globally competitive brain research, provide cutting-edge care for people with brain disorders and build promising market presence. These players are building the foundation of an emerging neurocluster; however, without OBI's critical contribution to cross-sector collaboration, its growth, innovative capacity and health impact will not be realized.

The Ontario Brain Institute represents a visionary investment in Ontario's future as a leader in brain science, a thriving neurocluster and a place where minds fulfill their potential.

