Improving Brain Health Through Collaboration

2017/18 ANNUAL REPORT

ONTARIO BRAIN INSTITUTE
INSTITUT ONTARIEN DU CERVEAU

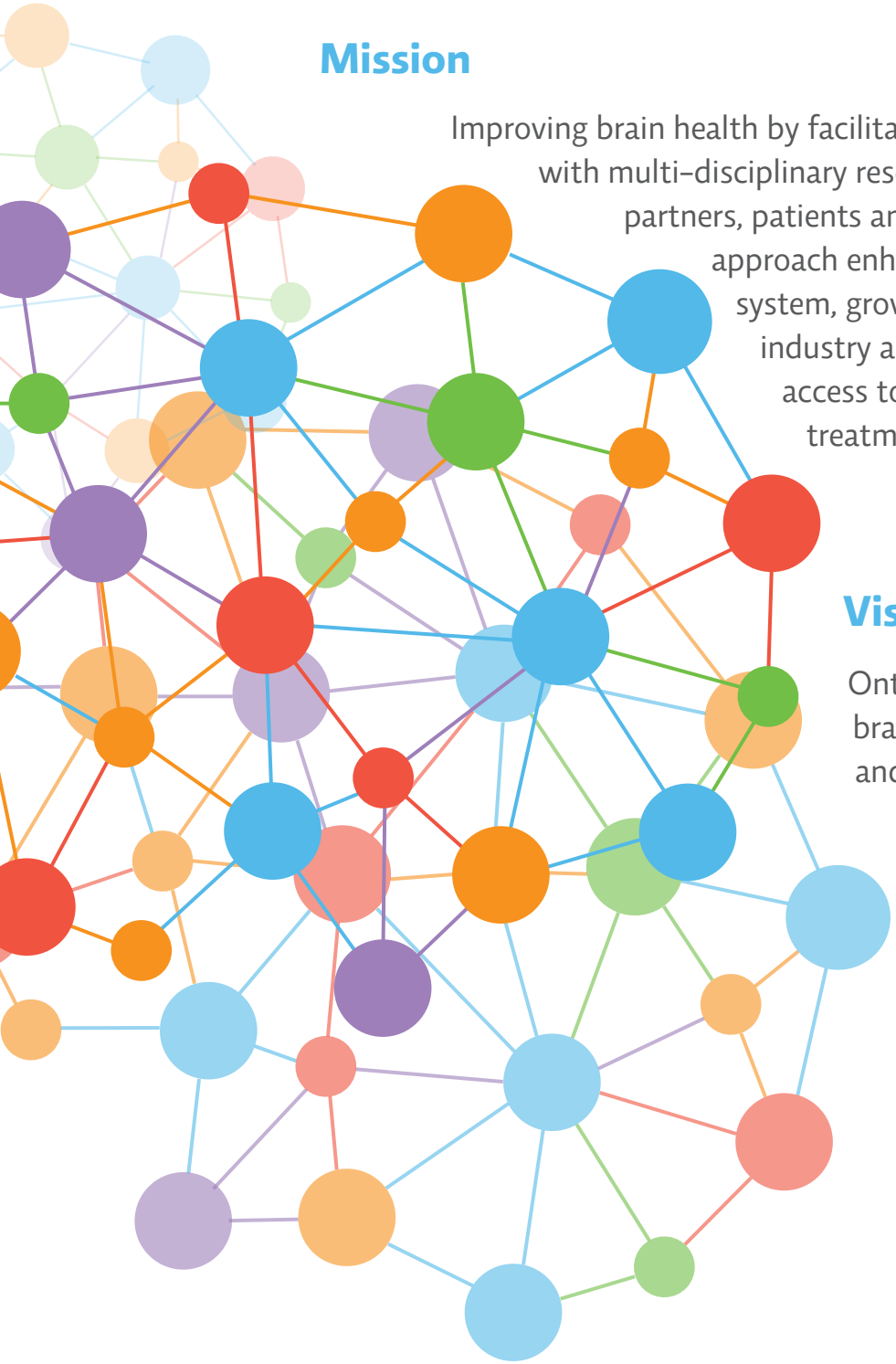
Table of Contents

Contact Us

Ontario Brain Institute
438 University Avenue
Suite 1618
Toronto, ON M5G 2K8
(647) 847-9000
1 (866) 637-6301
email: info@braininstitute.ca

The Ontario Brain Institute is a provincially funded, not-for-profit research organization seeking to maximize the impact of neuroscience and establish Ontario as a world leader in brain research, commercialization and care. OBI creates convergent partnerships between researchers, clinicians, industry, patients, and their advocates to foster discovery and deliver innovative products and services that improve the lives of those living with brain disorders.

About the Ontario Brain Institute (OBI)



Mission

Improving brain health by facilitating successful collaboration with multi-disciplinary research teams, clinicians, industry partners, patients and advocates. This innovative approach enhances the neuroscience research system, grows the Ontario neurotechnology industry and provides better public access to reliable information, tools and treatments regarding brain disorders.

Vision

Ontario as a world leader in brain research, commercialization and care.

Our Principles

Excellence

We have the best scientists and advisors in science, industry, advocacy, informatics analytics, and evaluation. The bar we hold ourselves to is "best in the world".

Integration and collaboration

We can only compete globally if we harness strengths from across the province. This means integrating talent and efforts across institutions (universities, hospitals), stakeholders (people, companies, patients, and government), disciplines (basic, translational, clinical, data science) as well as collaboration and data sharing within and across research programs.

Standardization and open science

If data are going to be stored and used indefinitely, they need to be of the highest quality, comparable, and secure. Data are standardized within and across all of our research programs. In the era of global team science, the principles of open data enable fresh approaches and partnerships. An open science mentality that adheres to the highest standards of privacy and security maximizes the use of research data and gives hope to those living with disorders while respecting those who have participated in research studies.

Impact-driven

Everything we support either goes toward improving care or commercialization. We provide the infrastructure that allows for discovery, validation, and evaluation of impacts.

Sustainability

Our work is built on existing investments and relies on partnership. We leverage $2 for every dollar that Ontario invests in us.

Brain disorders are where cancer was 50 years ago

Brain disorders are difficult to study 'in action' because of the billions of tiny cells forming trillions of intricate connections. Diagnosing brain disorders based on behaviours and symptoms (e.g. memory, mood) is analogous to thinking about cancer based on body organs (e.g., lung, liver). Cancer has moved to the molecular era and in neuroscience, we are just at the advent of this era. OBI is helping usher forward this era, with new technology to better understand and treat brain disorders.

Why Brain? Why Ontario? Why Now?

Brain disorders affect
1 in 3
ONTARIANS

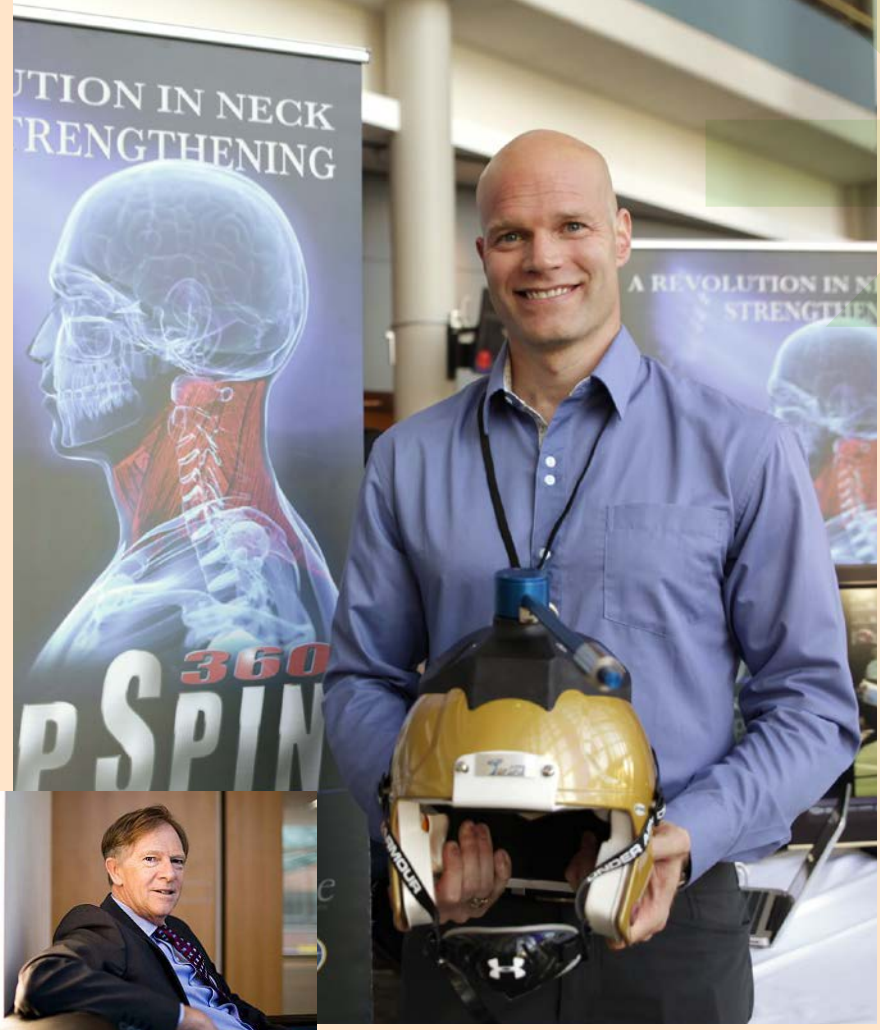
Ontario ranks
TOP 5
globally in science productivity

Personal and emotional costs are
INCALCULABLE

Brain disorders cost the province over
$4 BILLION ANNUALLY
in terms of direct costs, and substantially more in terms of indirect costs

Ontario has rich data on how its
14 MILLION PEOPLE
are treated by its healthcare system

800+
NEUROSCIENTISTS
Ontario has one of the highest concentrations in the world



Left: OBI ONtrepreneur, Theo Versteegh, Chief Technology Officer at TopSpin Technologies, developed a novel method of neuromuscular training for the neck to help prevent concussion called the TopSpin360 (TS360).

Below: Individuals, families, carers, and health/education professionals discuss the top 10 questions that the community needs answered at the Neurodevelopmental Disorders Priority Setting Partnership workshop in Toronto.

Dr. Sidney Kennedy, Scientific Director of CAN-BIND, OBI's depression program.

A Toronto dance class designed by OBI partner Sarah Robichaud for those living with Parkinson's disease increases awareness of the body in stillness and motion.

Message from the Board Chair

On behalf of the Board of Directors, I am pleased to share OBI's successes this year.

These achievements are a direct result of our model of collaboration among clinical, research and academic institutions and teams which also include the integration of industry and patients groups. By working together and drawing on our shared knowledge, we are well on the way to positioning Ontario as a world leader in brain research, commercialization and care.

OBI was established in 2010 with funding from the Ontario government in recognition of the need for an institute dedicated to accelerating the health and economic impacts of the province's world-class neuroscience community. It was the vision of the late philanthropist Joseph L. Rotman and our founding President Dr. Donald Stuss, to focus on improving Ontarian's brain health by helping stakeholders work together. OBI pioneered this collaborative approach and is a leading player in translating research into tangible products that benefit people. OBI is one of the only organizations globally to fund translational research programs that cross the lifespan. It is this unique approach and the OBI's ability to demonstrate considerable health and economic impact that, I am pleased to say, have led to another five years of funding from the Ontario government.

Hugh MacKinnon
Board Chair

On top of the excellent research work, for every dollar provided by the Ontario government, OBI leverages an additional two dollars from national, international, and private sources. The OBI's programs celebrate outstanding returns on investment, with the ONtrepreneurs program bringing a return of 10:1 and with the research programs bringing in additional grants that exceed $80 million.

We will continue, with a laser-like focus, to target new discoveries, commercialize new technologies and techniques, deliver social and economic returns on past investments and current resources, and concentrate on the most urgent needs of Ontarians with brain disorders.

Hugh MacKinnon

"By working together and drawing on our shared knowledge, we are well on the way to positioning Ontario as a world leader in brain research, commercialization and care."

Message from the President & Scientific Director

OBI's collaborative approach of bringing researchers, clinicians, industry, patients and their advocates together to benefit those living with brain disorders is the same today as it was in 2010 when OBI was established. Now, OBI is well positioned in the neuroscience field for being one of the first to make 'team' and 'collaboration' synonymous with 'research.'

As we look to the future, OBI is poised to push Ontario onto the world stage as a leader in brain research, commercialization and care. No other organization operates in an open environment where research is so widely shared and knowledge is so collaboratively integrated both for economic development and improved care. Our teams are constantly learning from each other and from our industry, research, and patient and family advisors.

Tom Mikkelsen, M.D.
President &
Scientific Director

Our work over the past year is evidence of our role in the broader innovation ecosystem. We are the convenor and catalyst and we deliver health and economic impacts faster. At the core of our work are some of the world's top researchers. Our role is to support them so that they can collaborate with each other, share data, work with industry, start their own companies, liaise with government, engage patients and their advocates, and ultimately transfer their research findings and clinical expertise into better care.

This approach has and continues to lead to significant impact. All of our researchers have standardized the data that they collect with international standards – so that they can share it with each other and other researchers around the world. These data are housed in Brain-CODE, our state-of-the-art informatics platform designed to store, manage and analyze data and serve as a "shared brain" for researchers in Ontario and beyond. Our commercialization programs help de-risk investment in neurotechnologies and bridge the funding gap between research and private capital. To date, we have supported 65 portfolio companies that are developing products and services to improve brain health, while generating economic growth. We have worked closely with patients and family members to develop new research priorities, to help create best-practice guidelines from the perspective of lived experience, and we have supported capacity building for front line carers.

We truly are on the threshold of a future where we will start to see significant advancements in treatments for the brain disorders that affect so many Ontarians. I am confident that the sum of our knowledge and openness to sharing is what links research to making a positive impact on brain health. I am grateful to have a team that is passionate about our common goal and purpose. We have made great strides, but the journey is far from over. I look forward to what OBI will accomplish and I am pleased to travel that path with you.

Tom Mikkelsen, M.D.

"Our work over the past year is evidence of our role in the broader innovation ecosystem. We are the convenor and catalyst and we deliver health and economic impacts faster."

Top: OBI ONtrepreneur, Sojourn Labs are building a new type of vehicle for cities by combining the safety and comfort of a car with the environmental and cost benefits of a bicycle for people living with Parkinsons.

Bottom: OBI has co-funded the Wilfred and Joyce Posluns Chair in Women's Brain Health and Aging. Dr. Gillian Einstein is studying cognitive aging and associated disorders on women's brain health.

Collaboration in Action

OBI's collaborative approach brings together researchers, clinicians, industry, patients and their advocates to enhance the neuroscience research system, grow the Ontario neurotechnology cluster and improve the brain health of Ontarians. The following stories showcase just a few examples of OBI's "Collaboration in Action." You will learn about the successes that result from OBI's role in supporting proactive, strategic and innovative partnerships.

Networking for Epilepsy Care – Project ECHO

Approximately 90,000 Ontarians have epilepsy and 6,000 new cases of epilepsy are diagnosed each year. It is a condition that has been historically under-funded, and heavily stigmatized. In the last seven years however, the province of Ontario has made significant strides in making Ontario a world leader in epilepsy research and care.

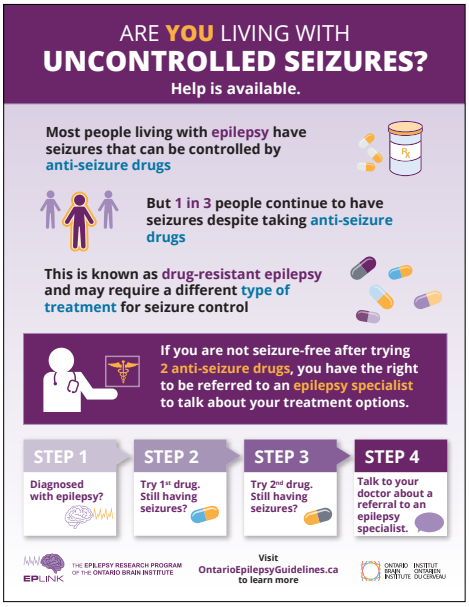
Ontario has invested a significant amount of money in epilepsy research through OBI. This funding supports a network of clinical and research experts known as EpLink (OBI's epilepsy research program). Its researchers have been working on finding new ways to diagnose, treat and improve the lives of people living with drug-resistant epilepsy. The program aims to bring health innovations directly to the epilepsy community.

The province also created the Epilepsy Implementation Task Force, which includes several members of EpLink, to form a group of epilepsy specialists and stakeholders who were charged with creating Canada's first clinical practice guidelines for the disorder. In 2017, after completing its mandate, members of the task force successfully obtained a grant from the Ministry of Health and Long-Term Care to launch "Project ECHO: Epilepsy Across the LifeSpan." This initiative is a technology-enabled, collaborative program that partners community health care providers and epilepsy specialists to enhance care for children, adolescents and adults living with epilepsy. The Project ECHO epilepsy interdisciplinary teams are based in 10 hospitals across the province and include an epileptologist, nurse practitioner, pharmacist, social worker and community agency representative connected with Ontario's regional epilepsy programs.

The ECHO program is creating an Ontario-wide network of primary care providers who they will train to develop expertise in diagnosing and treating epilepsy. This capacity building will begin to have system-wide effects that help people receive better epilepsy care.

Since ECHO and EpLink share many of the same experts, this linkage provides an opportunity to align the separate investments by the Ontario government in epilepsy research and care. The EpLink program itself has created an array of high quality outreach materials aimed at promoting Ontario's epilepsy care guidelines for the public, practitioners, and pharmacists.

This is an exciting time for people involved in epilepsy research and care. We have a large, high-powered research program in EpLink, new clinical practice guidelines directing epilepsy care, and an ECHO program that is building capacity among front-line practitioners to provide high quality care.



Facilitating Knowledge to Promote Wellness in First Nation Communities

Suicide disproportionately impacts First Nations people in Canada. For example, rates of suicide are five to seven times higher in First Nations men between 15–24 years of age.

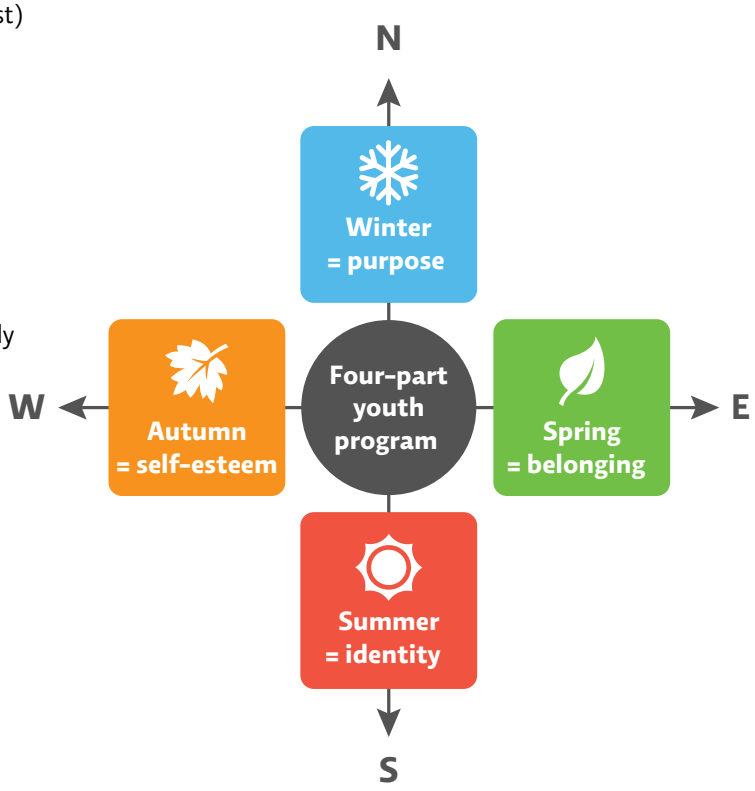
In 2016, OBI and CAN-BIND (OBI's depression research program) began a partnership with an Ontario First Nation community to run a four-part community-based youth program that encourages wellness and appreciation for life. The goal of the program is to build resiliency within the community, promote life and reduce suicides. The holistic outreach program was co-designed with the community elders, youth, and health team and it focused on a connection to the land.

This partnership uses a 'two-eyed seeing' approach, where Indigenous and Western traditions and teachings are used to inform a program. Both approaches are seen as separate but equal and used to develop a program which combines the evidence from western medicine and cultural wisdom from Indigenous teachings. The community chose to base the program on cardinal directions and the seasons; spring (east) speaks of *belonging;* summer (south) is based on *identity;* autumn (west) focuses on *self-esteem* and winter (north) highlights *purpose.*

Working alongside the representatives of the First Nation community, OBI and CAN-BIND helped to develop the program content and provide tools and resources. They also offered training to community staff on program sustainability so that the community can wholly own and run the program long-term.

For the community, the program is the beginning of a dialogue with their youth about wellness and life promotion, inviting them to share their thoughts and experiences in a safe and cultural setting. With a focus on identity and belonging, the project has led to important learning on all sides; working together has led to an overall better understanding of how to approach mental health from Indigenous and Western perspectives.

In early 2018, OBI and CAN-BIND hosted their final community event on life promotion for Indigenous youth. It focused on purpose and how it relates to the Anishinaabe way of life. The youth learned from elders and other community members about their life purpose in a cultural context, with a focus on water and connection to the land.



POND Data Release – Open Data on Autism

Brain–CODE

OBI's neuroinformatics platform, Brain–CODE, offers open access to data for the first time. The state–of–the–art platform is designed to store, manage, and analyze the many different types of data collected by researchers.

In the age of big data, new research technologies are creating a flood of information about the brain. Brain–CODE allows scientists, clinicians, and industry to work together with this rich store of data enabling breakthroughs in brain health to happen more quickly. Brain–CODE supports the research and data management for over 240 researchers from 40 institutions across Canada, making it an unprecedented data sharing enterprise.

This past year, OBI co–funded a project led by Dr. Jason Lerch at The Hospital for Sick Children (Sick Kids) that used high–resolution Magnetic Resonance (MR) imaging of mice. These data will help researchers to explore how autism spectrum disorder (ASD) affects the brain in order to accelerate the discovery process leading to a better understanding of the disorder and to treatments for children with ASD.

Building upon the existing data in Brain–CODE from
240
researchers
across the country

The open data release includes 31 mouse models related to autism, representing 23 phenotypes from an ongoing study with currently more than 90 mouse models by OBI's research program on neurodevelopmental disorders – POND. Drs. Jason Lerch, Jacob Ellegood, Mark Henkelman and their team at SickKids collaborated with over 30 labs across about 10 countries to collect MR images with genetic mutations that are known to be associated with ASD. The images identify key brain areas affected by autism and capture the resulting complex changes in the brain structure across the mouse models, providing key insights when comparing structural differences found in people with ASD.

This was the first public data release on Brain–CODE. OBI is committed to driving data–sharing opportunities and aims to make all of its research data accessible in the future. In the era of big data and the need for innovation from diverse data types, Brain–CODE's design offers the support to manage large volumes of data and enable higher–order analytics. Meeting the highest standards of data privacy and security, Brain–CODE's robust governance framework encourages data sharing and collaboration, without compromising participant privacy. In recognition of this, ***OBI was designated a Privacy by Design ambassador by the Information and Privacy Commissioner of Ontario in 2012.***

Dr. Jason Lerch, Senior Scientist, Neurosciences & Mental Health, The Hospital for Sick Children

CAMH adopts Brain–CODE to Power Krembil Centre for Neuroinformatics

The Krembil Centre for Neuroinformatics was established in September 2017 at the Centre for Addiction and Mental Health (CAMH) to accelerate global collaborations in brain science by using the power of big data, artificial intelligence and brain modeling to fundamentally change how mental illness is understood. Researchers at Krembil study multiple and large collections of data about the brain. They seek to understand and depict the brain's structures, how it works and how a range of factors play a role in mental illness, including addiction.

Dr. Sean Hill, Director of the Krembil Centre for Neuroinformatics at CAMH

To help realize the vast potential of big data to understand mental illness, the Krembil Centre created a centralized database that is powered by Brain–CODE – OBI's neuroinformatics platform designed to store, manage, and analyze the many different types of data collected by researchers around the province. No other platforms were available to meet CAMH's neuroinformatics needs. In addition to providing a base neuroinformatics platform for standardized data collection, ***OBI helped the Krembil Centre by setting up a governance structure that allows open data initiatives, while protecting privacy and ensuring research ethics.*** After an initial one–year contract, the full architecture of Brain–CODE was adopted.

Recently, CAMH signed a second–year contract with OBI to support the rollout and further extension of its neuroinformatics platform. The adoption of the Brain–CODE's platform at CAMH aligns a shared approach of improving lives of people living with brain disorders through collaboration. This potential is recognized by one of OBI's Brain–CODE Advisory Committee members, Dr. Sean Hill – a world leader in informatics, who previously worked as co–director of the Blue Brain Project in Switzerland. Dr. Hill was recently recruited as the inaugural director of the Krembil Centre for Neuroinformatics at CAMH.

The CAMH and OBI partnership also resulted in a co–authored manuscript submission to a special issue of Frontiers in Neuroinformatics – "Collaborative Efforts for Understanding the Human Brain" titled Brain–CODE: A Secure Neuroinformatics Platform for Management, Federation, Sharing and Analysis of Multi–Dimensional Neuroscience Data. The Frontiers journal publishes peer–reviewed research on the development and implementation of numerical/computational models and analytical tools used to advance theories of nervous system functions.

330,000+ clinical records have been uploaded to the platform since its adoption in July 2017

OBI is continuing to work closely with the Krembil Centre to advance the capabilities of Brain–CODE with the aim of using data and informatics to have real world impact.

From the Lab to Life: A Retinal Scanner for Early Detection of Alzheimer's Disease

RetiSpec

RetiSpec is currently testing a non-invasive, cost-effective, and accessible retinal scanner for early detection of Alzheimer's disease years before symptoms occur. Being able to identify biomarkers early will enable proactive clinical intervention methods. RetiSpec's technology will enable clinicians to intervene with emerging therapeutics upon early detection of the disease. RetiSpec has developed software and "plug and play" hardware components that can be applied directly to existing retinal cameras readily found in optometrists' offices. The accessibility and cost-effectiveness of the product makes it unique.

An estimated 285,000 Ontarians live with some form of neurodegenerative disorder and experience a decline in cognitive abilities and memory as a result of progressive loss of brain cells and brain cell function. Currently Alzheimer's disease is the most common of these disorders and places the heaviest burden on the health care system not only in Ontario, but North America.

Entrepreneur Eliav Shaked incorporated RetiSpec in Ontario in 2016. ***Born and raised in Israel, Eliav brought his start-up business here because of the province's reputation as a leader in brain research and for having a collaborative environment to help his business grow.*** In 2017, OBI awarded RetiSpec with $50,000 to fund his start-up through the ONtrepreneurs program. The ONtrepreneur program assists early stage entrepreneurs to commercialize brain-related technologies by accessing funding, mentorship, training opportunities and resources and support to launch or grow their venture. Currently, a clinical test of his retinal camera is being pilot studied in Israel. With OBI's support, RetiSpec hopes to conduct the same trial in Ontario as early as the first quarter of 2019.

"While thriving to be at the forefront of neurotech, OBI leads with the moral courage needed to truly make an impact. I'm humbled and proud to be part of it."
Eliav Shaked, M.Sc,
Founder & CEO, Retispec

"While thriving to be at the forefront of neurotech, OBI leads with the moral courage needed to truly make an impact. I'm humbled and proud to be part of it." says Eliav Shaked, Founder & CEO at Retispec.

Eliav is grateful to OBI for its commitment to building the neurotech industry by funding start-ups that will positively impact the lives of those brain disorders. He believes the development and implementation of technology that enables early detection of Alzheimer's disease has the potential to increase treatment options and improve the lives of individuals with Alzheimer's disease.

Uniting for Better Care for Children Living with Autism

There is a saying that, "If you have met one person with autism, then you have met one person with autism." Children with autism and their families have long been sharing this message. Therapists, researchers, and other professionals are listening, including Awake Labs, a Toronto–based company that participated in the 2017 ONtrepreneurs Program with the OBI.

The team at Awake Labs originally from British Columbia, moved to Ontario because of the excellent work being done in brain research. Their platform – Reveal is leveraging artificial intelligence to support decision making for personalized care for Autism Spectrum Disorders (ASD) and to empower families, self–advocates professionals, and caregivers to better understand the strengths and needs of each person they support.

Andrea Palmer, CEO and founder of Awake Labs

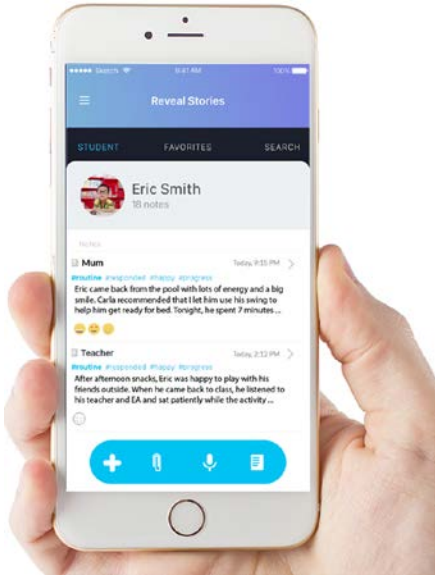
Recognizing the importance of a platform such as Reveal, OBI provided Awake Labs with $50,000 in funding and facilitated an introduction to The Village Because It Takes One Inc. (The Village). The Village is a community–based service provider for children with ASD and their families. OBI saw alignment between the Village's approach to child–centric care and individualized learning and the value that Reveal could provide in this setting. This introduction resulted in a partnership combining expertise from both organizations towards one common purpose – providing evidence–based care to people with autism.

In collaboration with The Village, the team at Awake Labs explored how society could be set up to better care for children with autism. Currently, teachers and caregivers can't talk to each other due to procedural and bureaucratic barriers. The burden of this communication falls to parents. There is also limited external guidance for teachers to understand behaviour and a shortage of trained professionals to provide 1:1 support to students with ASD in their classrooms. There are also administrative inefficiencies and complex tools that limit access to the data required to design even better care strategies. These challenges can only be solved with community–based partnerships between organizations like The Village and Awake Labs.

In the short time they have been using Reveal, The Village has experienced measurable improvements in their internal processes, allowing them to focus more time directly working with their learners. In partnership with The Village, Awake Labs will continue to deliver results that will empower them and the families they support to better understand the strengths and needs of each of their learners.

"Support from OBI, has directly led to key partnerships and given us connections to world class researchers in neurodevelopmental disorders. In the future we would like to scale the impact of Reveal from autism, to care for all brain and mental health disorders" says Andrea Palmer, CEO at the Awake Labs.

A successful community–based partnership between Awake Labs and The Village facilitated by the OBI enables designing of appropriate interventions, faster reach to targeted goals and improved therapy outcomes. Awake Labs is excited to be supported by OBI to forge other successful partnerships in order to translate early learnings into clinically validated benefits and services for people living with autism.

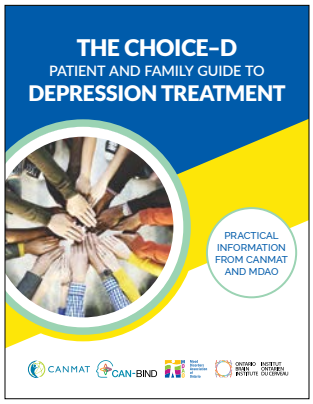


Collaborating with Patients – Translating Research to Communities

OBI is committed to facilitating the movement of research into action by raising awareness and bringing research to the community to ensure positive impact is being made. This knowledge transfer is important because it acts as a bridge connecting the research to life. The following guidelines are recent examples of evidence–based knowledge transfer into the communities.

The Choice–D Patient and Family Guide to Depression Treatment

In 2016, CANMAT (Canadian Network for Mood and Anxiety Treatments) updated the clinical guidelines for management of depression (2016 Clinical Guidelines for the Management of Adults with Major Depressive Disorder). These guidelines, which are lengthy and contain a good deal of medical jargon, are very unlikely to be read by anyone outside the medical field. Earlier this year, CAN–BIND and the MDAO (Mood Disorders Association of Ontario) worked together to create a plain–language version for the public, the Choice–D Patient and Family Guide to Depression Treatment. This initiative began with a call for people with both writing experience and lived experience with depression. They received responses from 64 people across Canada. CAN–BIND and MDAO worked with the successful candidates to create a unique set of guidelines written by people with depression for people with depression. The guidelines seek to empower people by giving them access to reliable information about treatment options and coaching tools so that they can feel more comfortable and better informed in conversations with their healthcare providers. CAN–BIND and MDAO are now working on a French translation for the guidelines and developing a dissemination plan for broad distribution.



Ontario Epilepsy Guidelines

OBI's epilepsy research program, EpLink, has the development of plain language summaries of the Ontario Epilepsy Guidelines series. The summaries can be found at the Ontario Epilepsy Guidelines webpage along with other educational resources for patients and health care providers.

With these plain language summaries of the epilepsy guidelines, people living with drug–resistant epilepsy will be more aware of the most appropriate treatment options, and be able to make an informed decision about seizure surgery. Through promotion of the guidelines, EpLink aims to have an increased number of referrals to epilepsy specialists and comprehensive specialty centres, where people can receive individualized therapy more quickly.

This website highlights some of the informational documents and videos developed by EpLink to help the public understand the process of referral to specialized epilepsy centres and to raise awareness around the guidelines and epilepsy treatment options. The recommendations found in the guidelines series were developed to improve the quality and consistency of epilepsy care, and to ensure that all Ontarians with epilepsy have timely access to treatment, including surgical care.

Collaborating for Better Understanding – Setting Research Priorities that Matter

OBI is thinking differently about the way research is conducted. Traditionally, researchers choose which research topics to study, but they may not be fully aware of the issues and uncertainties that matter most to families and patients.

POND NETWORK
Province of Ontario Neurodevelopmental Disorders

In February 2016, OBI and POND (OBI's neurodevelopmental disorders research program) began a research priority setting initiative in partnership with the James Lind Alliance (JLA). OBI believes that patients, carers and clinicians should work together to help identify research priorities.

The purpose of this work was to learn from people living with neurodevelopmental disorders, their families, carers and service providers about what challenges they face and what questions they would like to see answered. OBI and POND held a stakeholder engagement workshop in September 2017 to finalize Ontario's top ten intervention priorities for neurodevelopmental disorders. The process and results of this stakeholder–set research priority initiative have been made available on the OBI and JLA websites. OBI has shared these results at the Ontario Association of Developmental Disabilities conference, the Ontario Rett Syndrome Association conference and the Canadian ADHD Resource Alliance conference. OBI is also sharing the results with researchers to help them orient their research towards what is important to the patient community.

With over 1,200 questions received from 300 members of the Ontario neurodevelopmental disorder community, this initiative provides an important outlet for the voice of the patient community.

The resulting Top 10 Research Priorities for Neurodevelopmental Disorders will guide researchers in future studies to make positive impact on the lives of those with neurodevelopmental disorders. A final report is expected to be released in summer of 2018 and the data gathered will be open for researchers and interested members of the public to access through OBI's Brain–CODE platform.

In the Spotlight

Using AI and Big Data to Treat Parkinson's

OBI partnered with the University Health Network (UHN) Movement Disorders Clinic and IBM on a proof-of-concept study utilizing IBM Watson technology to identify compounds to treat Parkinson's disease. IBM Watson is a computer system capable of answering questions posed in natural language. Results were presented as posters at the 13th International Conference on Alzheimer's and Parkinson's Disease in Vienna, and at the International Congress of Parkinson's Disease and Movement Disorders in Vancouver. Dr. Naomi Visanji, Krembil Research Institute, was funded by the Canadian Institutes of Health Research (CIHR) to perform follow-up analyses on results from the OBI-sponsored IBM Watson project.

Ketogenic Diet as a Treatment Option

EpLink, published a study on the healthcare utilization for children on the ketogenic diet. A ketogenic diet is a high-fat, adequate-protein, low-carbohydrate diet that is used to treat epilepsy in children. The publication showed that children with epilepsy required fewer healthcare resources after starting the diet, which led to a decrease in healthcare costs. The results have been disseminated to many clinicians and as a result, there have been an increased number of referrals to the keto program at Children's Hospital of Eastern Ontario thanks to Dr. Sharon Whiting.

Genetic Link Identified in Children With Hemiplegic Cerebral Palsy

A study featuring sevaral OBI researchers was published in Genetics in Medicine identified a genetic link to cerebral palsy (CP). CP is the most common cause of physical disability in children, and considered to be caused by factors such as birth asphyxia, stroke, and infection in the developing brain. However, new ground breaking evidence suggests a much stronger underlying genetic link in children with hemiplegic CP – the most common type of CP – than previously thought. This research was a collaboration led by scientists Dr. Darcy Fehlings and Dr. Richard Wintle at Holland Bloorview Kids Rehabilitation Hospital and The Hospital for Sick Children (SickKids), and funded by CP-NET (OBI's cerebral palsy research program). The research was a collaborative effort involving clinicians and scientists across numerous Ontario institutions working with individuals with CP and their families.

OBI Awards

In June, OBI received Epilepsy Toronto's H.O.P.E. (Helping Out People with Epilepsy) award in recognition of our work acquiring new knowledge that will improve the quality of life for those with epilepsy and their families for generations. Earlier in the year, OBI received the Epilepsy Southwestern Ontario H.O.P.E. award in recognition for our work toward demonstrating compassion and caring for people living with epilepsy.

Connecting Research Data to Population-Level Health Administrative Data

Linking research data with population-level health administrative data may provide insights that will help us better understand brain disorders. Many disparate research, clinical, and population data sets exist, but few can be linked. OBI has partnered with the Institute for Clinical Evaluative Sciences (ICES) to solve this issue. ICES uses population-based health information to produce knowledge on health issues and holds the administrative health records of more than 14 million Ontarians. **These data linkage projects will create opportunities for new research to track the development of diagnoses, treatment responses, and other long-term outcomes.** OBI and ICES are preparing for two pilot linkage studies involving participants from OBI's Integrated Discovery Programs (EpLink and POND), these linkages are expected to be completed in the fall of 2018.

ONDRISeq Lowers DNA Diagnosis Assessment Costs and Offers Faster Results

ONDRI (OBI's neurodegenerative disorders research program), is studying dementia and how to improve the diagnosis and treatment of neurodegenerative diseases. Dr. Rob Hegele and team created ONDRISeq, a custom re-sequencing panel for ONDRI participants. This technology allows for low cost, comprehensive and efficient assessment of the DNA sequence with the potential to be a faster and more cost-effective way of diagnosing neurodegenerative diseases. The gene chip includes the top 80 genes currently identified as being involved in the major neurodegenerative disorders.

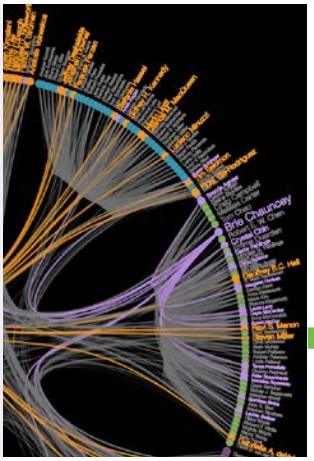
ONDRI is working to assess whether the ONDRISeq panel can be a Ministry of Health and Long-Term Care funded clinical diagnostic assay. The current gene sequence tests cost about $4000-5000 CAD each and are done outside of Canada. The ONDRISeq chip costs $300-$500 CAD each and the test is done in Canada. Currently, clinics request approximately 1,000 sequences per year. **If ONDRISeq is adopted, the estimated health care savings would be about $4.2 million per year.**

OBI Hosts Neurotech Showcase in Ottawa

OBI's annual NeuroTech Ontario Showcase was held at the Innovation Centre at Bayview Yards. Guests were invited to see, touch, and experience some of the latest brain health technologies from the Ottawa region and beyond. They were also able to meet entrepreneurs, share experiences and learn about Ontario's neurotech cluster and OBI's innovative programs that help bring neurotechnologies to the community. Thanks to local community partners including Invest Ottawa, Bruyere Research Institute, CHEO, University of Ottawa, Carleton University and all the neurotech startups from across the province for sharing their innovative technologies with the general public.

Mapping Connections

Brains are powered by connections, and building connections is how the OBI is making brain research, commercialization and care work for Ontario. Ontario's neuroscience community boasts 800 researchers, nearly 200 companies and over 100 organizations related to the brain. With our new plug-in 'Our Stories' on AxON (the Atlas of Ontario Neuroscience, a visual connections map), you can read our collaboration stories from across the province. Explore AxON to discover the vast number of assets in Ontario and how OBI connects them together to improve brain health.



OBI Shares Research Knowledge

OBI hosts public talks to empower people with knowledge about the brain and how they can maximize their own brain health. **To date, we have hosted 13 talks, attended by nearly 5,000 people and live streamed by another 1,000.** All of these talks are available on OBI's YouTube channel. One of our recent public talks was on "Intimate Partner Violence and Concussion" featuring Dr. Eva Valera, a professor at Harvard University, the Ontario Brain Injury Association, and a personal account from a survivor of intimate partner violence. Another on "Promoting Mental Wellness in Indigenous Communities", featuring Carol Hopkins, Dr. Suzanne Stewart and Dr. Micheal Dan. Over 300 people attended the event in person while an additional 110 people live-streamed the talk through our partnership with TVO. An additional 400 people have viewed the recording since the talk. TVO published five articles on Indigenous mental health featuring our speakers and OBI. Dr. Suzanne Stewart and Dr. Gerald McKinley made an appearance on The Agenda by Steve Paikin to discuss OBI and CAN-BIND's role in promoting mental wellness within Indigenous communities.

ONDRI – Potential for Modifying Treatment Protocol for Some Patients

The ONDRI (OBI's neurodegenerative disorders research program) study has led to meaningful changes in treatment for some patients and the identification of unauthentic findings in others. It emphasizes the importance of embedding research in care to help better diagnose and treat people with brain disorders.

Brain-CODE Partners on Canadian Open Neuroscience Platform (CONP) Initiative

The CONP, a $10.17-million grant partnership of 15 universities was announced to bring together many of the country's leading neuroscientist to form an interactive network of collaborations in brain research, interdisciplinary student training, international partnerships, clinical translation and open publishing. Through the CONP, leading neuroscientists from across Canada can pool data from diverse sources, making information easier to access and share. This will help researchers collect, link and analyze data from across the country more easily, leading to positive outcomes for patients. Brain-CODE (OBI's neuroinformatics platform) is one of the major partners in the CONP initiative, along with Longitudinal Online Research and Imaging System (LORIS) and MEDICS. In its inaugural meeting attention was focused on defining the first data sharing use cases.

Canadian Museum of Nature

OBI partnered with the Canadian Museum of Nature in Ottawa to host the Brain: The Inside Story exhibition in the summer of 2018. Through this partnership OBI showcased 25 Ontario-wide partners, hosted four public talks, and planned several interactive outreach events such, as Nature Nocturne and Brain Bonanza, to showcase Ontario's neuroscience community. This partnership is an opportunity to promote OBI's collaborative approach to science, feature local Ottawa researchers and community groups to a large public audience.

canadian museum of nature
nature
musée canadien de la nature

32 Devices

7 Therapeutics

26 Software/Informatics

65 Portfolio Companies

$4.9M OBI Investment in ONtrepreneurs and NERD Program

$48.4M External Follow-on Investment

10x RETURN

110 Interns Trained

82% Follow-on Employment Success

45 ONtrepreneurs FUNDED

To Build Neurotech Startups

$3.7M FUNDING

Raised In Less Than a Year
By the 2017 ONtrepreneur Cohort

Showcasing Ontario's Brain Power

OBI hosted "Meet Ontario's Brain Power!" at Queen's Park on September 11, 2017 to showcase the value for money of Ontario's investment in OBI. Over 60 OBI researchers, companies, and not-for-profit partners attended to demonstrate the reach and diversity of OBI's network, activities, and impacts.

Expanding Mental Wellness Initiative for First Nations Youth

OBI is working together with the Chiefs of Ontario and the government of Ontario to implement a province-wide mental wellness initiative for First Nations youth. The project uses the Photovoice method of narrative sharing to help address the issue of youth suicide and support life promotion. The project team will work closely with Indigenous organizations and leaders to develop a program plan that meets the needs of the community. **The program aims to train 240 youth from over 100 communities.**

Supporting Policy Change

Experts within OBI's network have participated in over 30 policy consultations at provincial, national, and international levels. OBI has been actively involved in the development of Ontario's Dementia Strategy through both the Ontario Dementia Advisory Committee and the Ontario Dementia Capacity Planning Project Team. The dementia capacity planning work has resulted in a tool that allows decision-makers to analyze how different scenarios and interventions impact the dementia care pathway. OBI's participation in this initiative facilitated connections to stakeholders in dementia research and care, and strengthened OBI's collaboration with policy-makers to enhance care.

Financial Statements of

ONTARIO BRAIN INSTITUTE

Year ended March 31, 2018

KPMG LLP
Vaughan Metropolitan Centre
100 New Park Place, Suite 1400
Vaughan ON L4K 0J3
Canada
Tel 905-265-5900
Fax 905-265-6390

INDEPENDENT AUDITORS' REPORT

To the Board of Directors of Ontario Brain Institute

We have audited the accompanying financial statements of Ontario Brain Institute, which comprise the statement of financial position as at March 31, 2018, the statements of operations and changes in net assets and cash flows for the year then ended, and notes, comprising a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian accounting standards for not-for-profit organizations, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements present fairly, in all material respects, the financial position of Ontario Brain Institute as at March 31, 2018, and its results of operations and its cash flows for the year then ended in accordance with Canadian accounting standards for not-for-profit organizations.

KPMG LLP

Chartered Professional Accountants, Licensed Public Accountants

July 17, 2018
Vaughan, Canada

ONTARIO BRAIN INSTITUTE

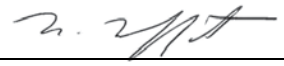
Statement of Financial Position

March 31, 2018, with comparative information for 2017

	2018	2017
Assets		
Current assets:		
Cash	$ 1,851,175	$ 3,697,868
Other receivable (note 7)	353,053	215,656
Prepaid expenses and deposits	161,509	374,215
	2,365,737	4,287,739
Capital assets (note 2)	279,255	316,132
	$ 2,644,992	$ 4,603,871
Liabilities and Net Assets		
Current liabilities:		
Accounts payable and accrued liabilities (notes 3 and 7)	$ 789,194	$ 829,951
Deferred revenue (note 4)	918,310	2,832,949
Deferred industry funds	250,000	250,000
	1,957,504	3,912,900
Deferred capital contributions (note 6)	134,040	141,874
Deferred lease inducement (note 5)	145,215	174,258
Net assets	408,233	374,839
Commitments (note 10)		
	$ 2,644,992	$ 4,603,871

See accompanying notes to financial statements.

On behalf of the Board:



Director

Director

ONTARIO BRAIN INSTITUTE

Statement of Operations and Changes in Net Assets

Year ended March 31, 2018, with comparative information for 2017

	2018	2017
Revenue:		
Grant - Ministry of Research, Innovation and Science	$ 21,922,473	$ 19,849,389
Donations	15,000	21,773
Interest	26,920	31,329
Other	225,347	422,365
	22,189,740	20,324,856
Expenses (note 9):		
Research Programs	14,116,255	12,529,417
Informatics and Analysis	3,351,125	2,945,474
Industry and Education	1,452,121	1,616,216
Administrative support	2,087,741	2,263,098
Knowledge Translation	1,149,104	933,233
	22,156,346	20,287,438
Excess of revenue over expenses	33,394	37,418
Net assets, beginning of year	374,839	337,421
Net assets, end of year	$ 408,233	$ 374,839

See accompanying notes to financial statements.

ONTARIO BRAIN INSTITUTE

Statement of Cash Flows

Year ended March 31, 2018, with comparative information for 2017

	2018	2017
Cash provided by (used in):		
Operating activities:		
Excess of revenue over expenses	$ 33,394	$ 37,418
Items not involving cash:		
Amortization of capital assets	93,680	100,237
Amortization of deferred capital contributions	(64,637)	(71,194)
Amortization of deferred lease inducement	(29,043)	(29,043)
Change in non-cash operating working capital:		
Other receivable	(137,397)	92,002
Prepaid expenses and deposits	212,706	(121,787)
Accounts payable and accrued liabilities	(40,757)	127,657
Deferred revenue	(1,914,639)	177,111
	(1,846,693)	312,401
Financing activities:		
Receipt of deferred capital contributions	56,803	44,694
Investing activities:		
Additions to capital assets	(56,803)	(44,694)
Increase (decrease) in cash	(1,846,693)	312,401
Cash, beginning of year	3,697,868	3,385,467
Cash, end of year	$ 1,851,175	$ 3,697,868

See accompanying notes to financial statements.

Ontario Brain Institute ("OBI") was previously incorporated on February 23, 2010 under the Canada Corporations Act as a not-for-profit organization without share capital. On April 2, 2013, OBI was continued under the Canada Not-for-profit Corporations Act.

OBI is funded by the Government of Ontario. OBI's existing contract with the Ministry of Research, Innovation and Science (the "Ministry") beginning April 1, 2013, ended on March 31, 2018. The Ministry has committed funding to OBI of $100,000,000 over five years. OBI has entered into a new contract with the Ministry beginning April 1, 2018.

OBI was established to become an internationally recognized centre of excellence in brain and neuroscience research, clinical application of research, commercialization of research and education and training in research discoveries, relating to prevention, early detection, diagnosis, treatment and control of brain diseases and disorders.

1. Significant accounting policies:

These financial statements have been prepared in accordance with Canadian accounting standards for not-for-profit organizations ("Not-For-Profit Standards") in Part III of the Chartered Professional Accountants of Canada Handbook. The most significant accounting policies are as follows:

(a) Revenue recognition:

OBI follows the deferral method of accounting for contributions.

Capital contributions for the purchase of capital assets are deferred and amortized into revenue on a straight-line basis at a rate corresponding with the amortization rate of the related capital assets.

Externally restricted contributions are deferred and recognized as revenue in the year in which the related expenses are incurred.

Unrestricted contributions are recognized as revenue in the year received or receivable if the amount to be received can be reasonably estimated and collection is reasonably assured.

Restricted interest income is recognized as revenue in the year in which the related expenses are incurred. Unrestricted interest income is recognized as revenue when earned.

1. Significant accounting policies (continued):

(b) Capital assets:

Capital assets are recorded at cost less accumulated amortization. Amortization is provided on a straight-line basis over the estimated useful lives as follows:

Computer hardware	3 years
Website	5 years
Furniture and equipment	5 years
Leasehold improvement	Over lease term

In the period of acquisition, 50% of the annual amortization rate is used.

(c) Financial instruments:

Financial instruments are recorded at fair value on initial recognition. Freestanding derivative instruments that are not in a qualifying hedging relationship and equity instruments that are quoted in an active market are subsequently measured at fair value. All other financial instruments are subsequently recorded at cost or amortized cost, unless management has elected to carry the instruments at fair value. OBI has not elected to carry any such financial instruments at fair value.

Transaction costs incurred on the acquisition of financial instruments measured subsequently at fair value are expensed as incurred. All other financial instruments are adjusted by transaction costs incurred on acquisition and financing costs, which are amortized using the straight-line method.

Financial assets are assessed for impairment on an annual basis at the end of the fiscal year if there are indicators of impairment. If there is an indicator of impairment, OBI determines if there is a significant adverse change in the expected amount or timing of future cash flows from the financial asset. If there is a significant adverse change in the expected cash flows, the carrying value of the financial asset is reduced to the highest of the present value of the expected cash flows, the amount that could be realized from selling the financial asset or the amount OBI expects to realize by exercising its right to any collateral. If events and circumstances reverse in a future year, an impairment loss will be reversed to the extent of the improvement, not exceeding the initial carrying value.

1. Significant accounting policies (continued):

(d) Controlled entity:

OBI has chosen not to consolidate the not-for-profit foundation it controls, and instead, to disclose summarize financial information of the controlled foundation.

(e) Allocation of expenses:

Salaries and benefit expenses are allocated to various functions based on estimated time spent. Consulting and travel expenses are allocated to the functions to which they are directly related.

(f) Use of estimates:

The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the year. Significant items subject to estimates and assumptions include the carrying value of capital assets and certain accrued liabilities. Actual results could differ from those estimates.

2. Capital assets:

			2018	2017
	Cost	Accumulated amortization	Net book value	Net book value
Computer hardware	$ 115,718	$ 109,221	$ 6,497	$ 19,491
Website	150,093	100,908	49,185	69,336
Furniture and equipment	160,361	145,260	15,101	45,303
Leasehold improvement	303,337	151,668	151,669	182,002
Software	56,803	–	56,803	–
	$ 786,312	$ 507,057	$ 279,255	$ 316,132

Included in administrative support expense is amortization of capital assets of $93,680 (2017 - $100,237).

3. Accounts payable and accrued liabilities:

Included in accounts payable and accrued liabilities are government remittances payable of $12,081 (2017 - $14,814), which includes amounts payable for payroll-related taxes.

4. Deferred revenue:

Funds received but not yet spent on intended restrictions are deferred and recognized as revenue in the year when the related expenses are incurred.

Changes in the deferred revenue balance during the year are as follows:

	2018	2017
Balance, beginning of year	$ 2,832,949	$ 2,655,838
Contributions received	19,943,197	19,955,307
Amounts amortized to revenue	(21,857,836)	(19,778,196)
Balance, end of year	$ 918,310	$ 2,832,949

5. Deferred lease inducement:

The deferred lease inducement represents a leasehold improvement inducement received from the landlord.

The deferred lease inducement is amortized over the term of the lease agreement to correspond to the asset to which it relates.

6. Deferred capital contributions:

Deferred capital contributions represent the unamortized amount of contributions received for the purchase of capital assets. Contributions are amortized over the life of the related asset.

6. Deferred capital contributions (continued):

Changes in the deferred capital contributions balance during the year are as follows:

	2018	2017
Balance, beginning of year	$ 141,874	$ 168,374
Contributions received	56,803	44,694
Amounts amortized to revenue	(64,637)	(71,194)
Balance, end of year	$ 134,040	$ 141,874

7. Related party transactions:

OBI is related to the Ontario Brain Institute Foundation (the "Foundation") by virtue of sharing common control.

OBI provides administrative support to the Foundation at no charge (2017 - nil). The arrangement is not recognized in the financial statements.

There are no amounts payable to or receivable from the Foundation at year end (2017 - nil).

8. Ontario Brain Institute Foundation:

The Foundation was incorporated under the Canada Corporations Act on March 3, 2010 and continued under the Canadian Not-for-profit Corporations Act on April 28, 2014. The Foundation is a registered charity under the Income Tax Act (Canada) and was established to fund academic and treatment centres in Canada that are qualified donees for purposes of the Income Tax Act (Canada), in furtherance of brain and neuroscience research and the education and training of brain and neuroscience researchers.

The Foundation's financial statements have not been consolidated in OBI's financial statements. There are no restrictions on the resources of the Foundation, nor are there significant differences from the accounting policies used by OBI.

8. Ontario Brain Institute Foundation (continued):

Financial summaries of the Foundation, reported in accordance with Not-For-Profit Standards, are as follows:

(a) Financial position:

	2018	2017
Assets		
Cash	$ 595,570	$ 1,397,619
Accounts receivable	–	781
Sales tax receivable	2,965	1,418
	$ 598,535	$ 1,399,818
Liabilities and fund balances		
Accounts payable and accrued liabilities	$ 28,097	$ 45,794
Fund balances	570,438	1,354,024
	$ 598,535	$ 1,399,818

(b) Statement of operations:

	2018	2017
Revenue	$ 56,803	$ 27,406
Expenses	840,389	656,205
Deficiency of revenue over expenses	$ (783,586)	$ (628,799)

(c) Changes in fund balances:

	2018	2017
Fund balances, beginning of year	$ 1,354,024	$ 1,982,823
Deficiency of revenue over expenses	(783,586)	(628,799)
Fund balances, end of year	$ 570,438	$ 1,354,024

8. Ontario Brain Institute Foundation (continued):

(d) Statement of cash flows:

	2018	2017
Decrease in cash from operating activities	$ (802,049)	$ (616,343)
Cash, beginning of year	1,397,619	2,013,962
Cash, end of year	$ 595,570	$ 1,397,619

9. Expenses:

During the year, salaries and benefit expenses have been allocated as follows:

	2018	2017
Administrative support	$ 1,287,394	$ 1,454,158
Knowledge Translation	547,292	531,900
Informatics and Analysis	213,700	283,984
Research Programs	1,019,070	956,808
Industry and Education	427,944	413,511
	$ 3,495,400	$ 3,640,361

10. Commitments:

(a) Lease and other commitments:

During the year and subsequent to year end, OBI entered into various operating contracts and leases for its premises, office equipment and other services. The future minimum payments for leases and other services are as follows:

2019	$ 898,002
2020	387,215
2021	334,454
2022	334,345
2023	333,202
Thereafter	27,498
	$ 2,314,716

10. Commitments (continued):

(b) Grant commitments:

OBI has approved grants of approximately $1,026,249 (2017 - $12,902,094), which will be paid in future years once the conditions of the grants have been met. These amounts are not reflected in the statement of operations and changes in net assets.

2019	$ 1,026,249

11. Financial risks:

(a) Liquidity risk:

Liquidity risk is the risk that OBI will be unable to fulfill its obligations on a timely basis or at a reasonable cost. OBI manages its liquidity risk by monitoring its operating requirements. OBI prepares cash forecasts to ensure it has sufficient funds to fulfill its obligations.

(b) Credit risk:

Credit risk refers to the risk that counterparty may default on its contractual obligations resulting in a financial loss. OBI is exposed to credit risk with respect to the accounts receivable. OBI assesses, on a continuous basis, accounts receivable, and provides for any amounts that are not collectible in the allowance for doubtful accounts.

There has been no change to the risk exposures from 2017.

Acknowledgements

Board of Directors

Chair:
Hugh MacKinnon,
CEO of Bennett Jones

Dr. Joseph Coyle,
Eben S. Draper Chair,
Harvard University

Michelle Khalili, Managing Director at CIBC, Capital Markets in the Investment Banking division

Valerie Pringle,
Journalist & Broadcaster,
Mental Health Advocate

Vice Chair:
Marcia Moffat,
Managing Director and Head of Canada, BlackRock

Dr. Susan Fitzpatrick,
President of the James S. McDonnell Foundation

Suzanne Labarge, Chancellor of McMaster University

Joyce Barretto, Program Director, Stikeman Elliott LLP

Dr. Tom Mikkelsen,
President & Scientific Director,
Ontario Brain Institute

Michael Horgan,
Senior Advisor to
Bennett Jones

Jeff Lozon, Chairman of Lozon Associates

Todd Vienneau, Director – Medical, Regulatory & Quality at Insulet Canada

Science Advisory Council

Chair: Dr. Joseph Coyle, Harvard University

Dr. Huda Akil, University of Michigan

Dr. Anna Barrett, Kessler Foundation

Dr. John Hardy, University College London

Dr. Joseph B. Martin, Harvard University

Dr. Trevor Robbins, Cambridge University

Industry Advisory Council

Chair: Todd Vienneau, Insulet Canada

Lisa Wilcox, Pfizer Canada Ltd.

Dr. Doron Sagman, Eli Lilly Canada Inc.

Pat Horgan, IBM Canada Ltd.

Dr. John Andrews, NeurAxon Inc.

Genevieve Lavertu, Medtronic of Canada Ltd.

Anne Vivian-Scott, BKIN Technologies

Cynthia Stewart, GE Healthcare Canada Ltd.

Alison McLean, Nestlé Health Science, Canada

Dr. Amyn Sayani, GlaxoSmithKline Inc.

Patient Advisory Committee

Amyotrophic Lateral Sclerosis Society of Canada

Alzheimer's Society of Ontario

Autism Ontario

Autism Speaks Canada

CanChild

Circle21

Community Living Toronto

Epilepsy and Seizure Disorder Resource Centre of South Eastern Ontario

Epilepsy Ontario

Epilepsy Resource Centre Kingston

Epilepsy Support Centre London

Epilepsy Toronto

Heart and Stroke Foundation

Mood Disorders Association of Ontario

Ontario Federation for Cerebral Palsy

Ontario Rett Syndrome Association

Parkinson Society of Ontario

SUDEP Aware

Threetobe

Totally ADD

Brain–CODE Advisory Committee Members

Sean Hill,
Director, Krembil Centre for Neuroinformatics,
Centre for Addiction & Mental Health (CAMH)

Rodrigo Lopez,
Web Production, European Bioinformatics Institute

John Mattison,
Assistant Medical Director & Chief Medical Information Officer, Kaiser Permanente

Charles Peck,
Neuroinformatics Consultant, Chief Scientist, NeuroMentix

Ann Cavoukian,
Privacy by Design Centre of Excellence, Ryerson University

Brain–CODE Analytics Advisory Committee Members

Gary Bader,
Donnelly Centre for Cellular & Biomolecular Research, University of Toronto

Vince Calhoun,
Executive Science Officer & Director, Image Analysis & MR Research, The Mind Research Network

Darrell Johnson,
Vice President Data Science – Business Solutions, Medtronic

Stinus Lindgreen,
Bioinformatics Specialist, Lundbeck

Patrick Martin,
School of Computing, Queen's University

Amyn Sayani,
Director, R&D Alliances & Real-World Evidence, GlaxoSmithKline

Daniel Zikovitz,
Sr. Solutions Architect, GE Healthcare

Founders

Lawrence and Frances Bloomberg, Mount Sinai Hospital

Sydney and Florence Cooper, Baycrest

Gerald and Geraldine Heffernan, University of Toronto

William and Susanne Holland, Holland Bloorview

Richard M. Ivey, Western University

Robert and Linda Krembil, University Health Network

Arthur and Sonia Labatt, The Hospital for Sick Children

Joseph and Sandra Rotman, Ontario Brain Institute

Lawrence and Judith Tanenbaum, Brain Canada

Eli Lilly Canada Inc.

GE Healthcare Canada Ltd.

GlaxoSmithKline Inc.

IBM Canada Ltd.

Medtronic of Canada Ltd.

Nestlé Health Science, Canada

Pfizer Canada Ltd.

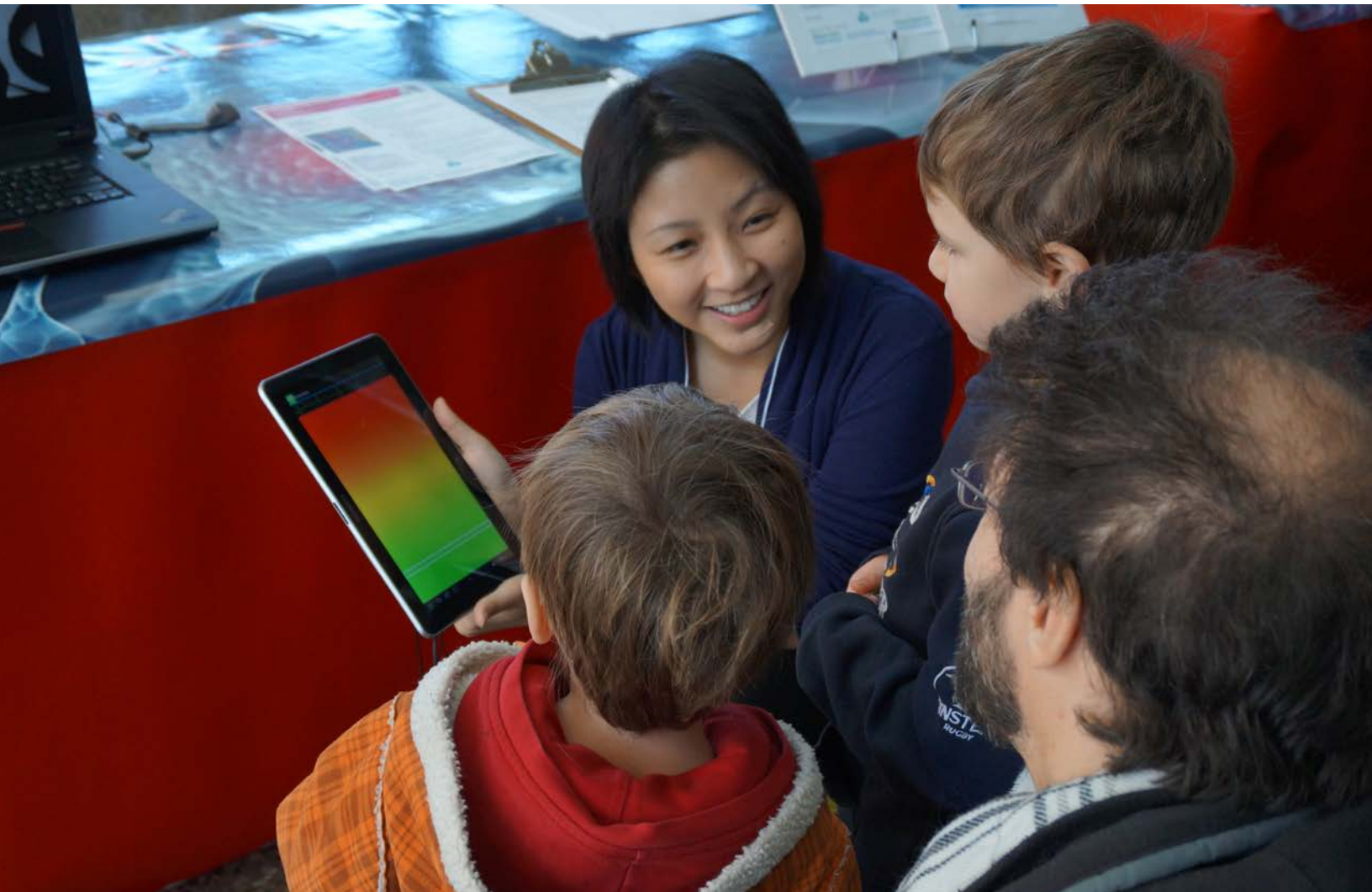
Valeant Canada LP

Founding President & Scientific Director

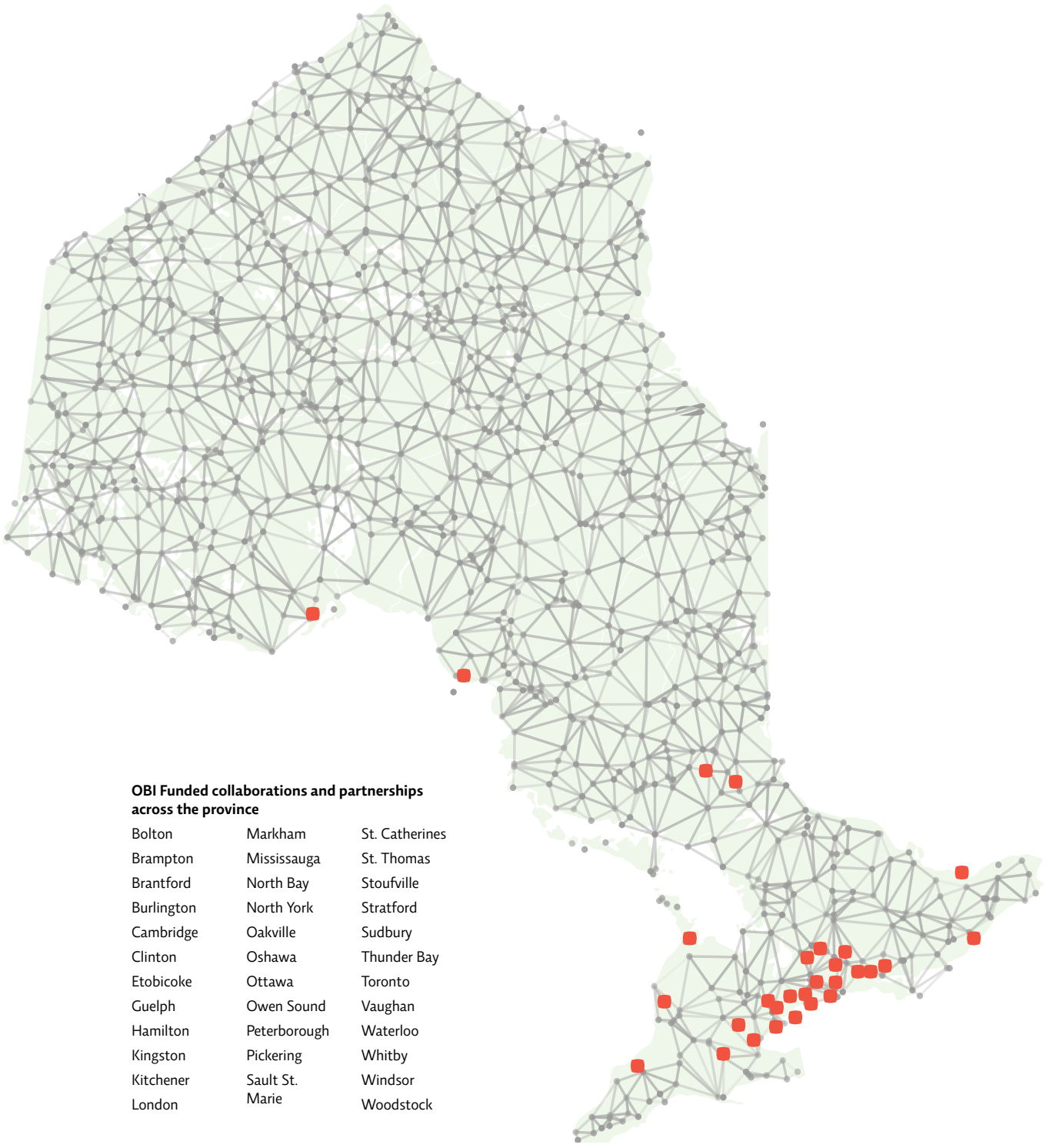
Dr. Donald T. Stuss,
Ontario Brain Institute

Founding Chair of the Board

Joseph L. Rotman,
Ontario Brain Institute



OBI's Network Across Ontario



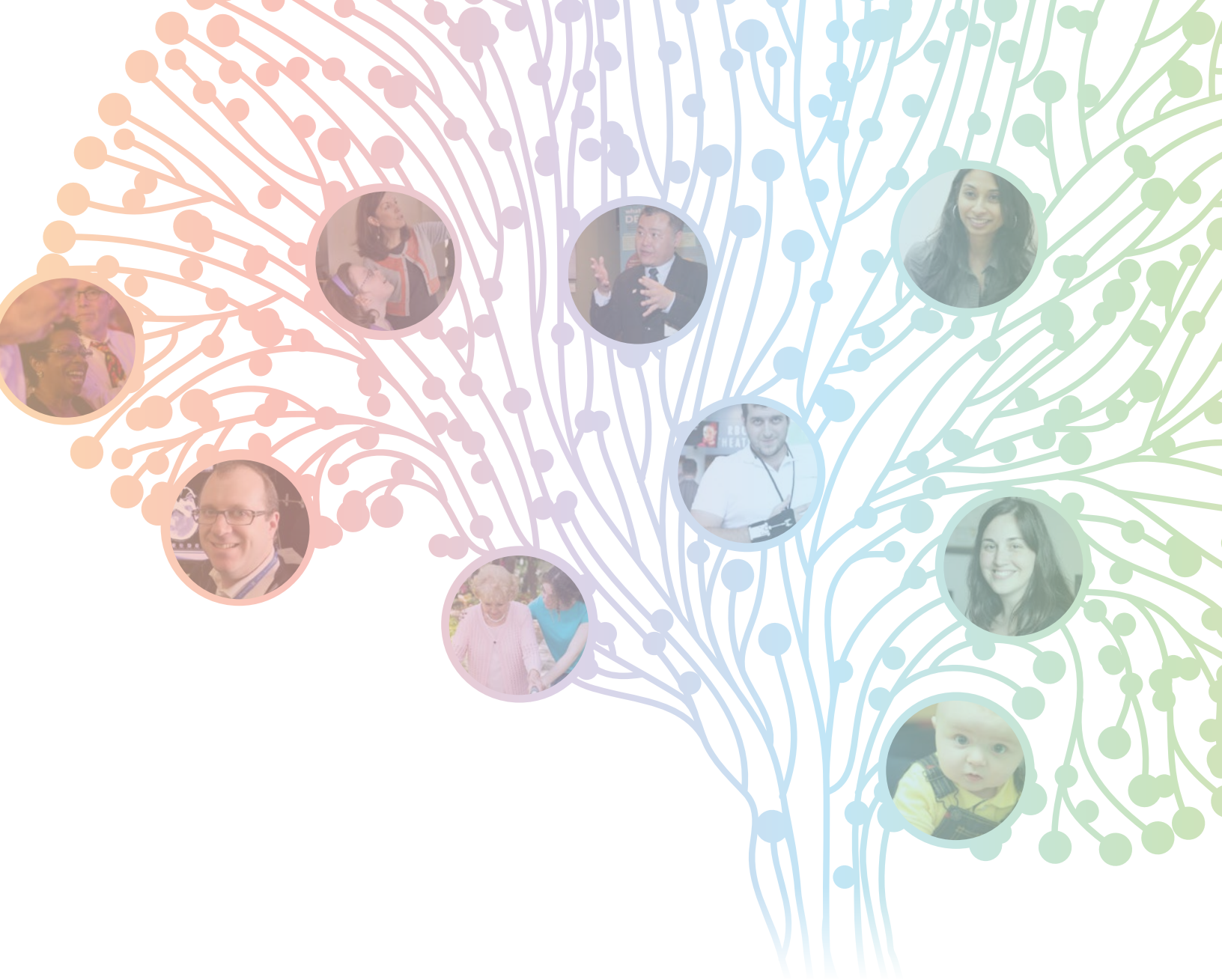
OBI Funded collaborations and partnerships across the province

Bolton	Markham	St. Catherines
Brampton	Mississauga	St. Thomas
Brantford	North Bay	Stoufville
Burlington	North York	Stratford
Cambridge	Oakville	Sudbury
Clinton	Oshawa	Thunder Bay
Etobicoke	Ottawa	Toronto
Guelph	Owen Sound	Vaughan
Hamilton	Peterborough	Waterloo
Kingston	Pickering	Whitby
Kitchener	Sault St. Marie	Windsor
London		Woodstock

Acronyms

Acronym	Definition
AACPDM	American Academy of Cerebral Palsy & Developmental Medicine
AODA	Accessibility for Ontarians with Disabilities Act
AD	Alzheimer's disease
ALS	amyotrophic lateral sclerosis
AxON	Atlas of Ontario Neuroscience
BASE	BioArray Software Environment
BEAM	Brain–Eye Amyloid Memory Study
BIO	Biotechnology Innovation Organization
BPS	Broader Public Service
BPSA	Broader Public Service Act
Brain–CODE	Centre for Ontario Data Exploration
CAHO	Council of Academic Hospitals of Ontario
CAMH	Centre for Addiction and Mental Health
CAN–BIND	Canadian Biomarker Integration Network in Depression
CARA	Canadian Association of Research Administrators
CC–ABHI	Canadian Centre for Aging and Brain Health Innovation
CCNA	Canadian Consortium on Neurodegeneration in Aging
CCRM	Centre for Commercializing Regenerative Medicine
CDE	Common data elements
CDRIN	Canadian Depression Research and Innovation Network
CFMM	Western's Centre for Functional and Metabolic Mapping
CIMT	constraint induced movement therapy
CIFAR	Canadian Institute for Advanced Research
CIHR	Canadian Institutes of Health Research
CIT	core innovation team
CNS	central nervous system
CP	cerebral palsy
CP–NET	Cerebral Palsy Integrated Neuroscience Discovery Network
CQDM	Quebec Consortium for Drug Discovery
CRO	contract research organization
DBS	deep brain stimulation
DICOM	Digital Imaging and Communications in Medicine
DSM V	Diagnostic and Statistical Manual of Mental Disorders
EDC	electronic data capture
EEG	electroencephalography
EHIL	Electronic Health Information Laboratory
EMT	entrepreneurship and management training
EMR	Electronic Medical Record
EpLINK	The Epilepsy Research Program of the Ontario Brain Institute
ERR	ethics restriction reports
ESP	Evaluation Support Program
FedDev	Federal Economic Development Agency for Southern Ontario
FTE	full–time equivalent
GA4GH	Global Alliance for Genomics and Health
GMFCS	Gross Motor Function Classification System (for Cerebral Palsy)
HIPA	Health Information Protection Act
HQO	Health Quality Ontario
HQP	highly qualified personnel
HTA	Health Technology Assessment
HTX	Health Technology Exchange
HVRS	Home Virtual Reality System
IAC	Industry Advisory Council/International Advisory Council
ICES	Institute for Clinical Evaluative Sciences
ICGC	International Cancer Genome Consortium
ID	Integrated Discovery
IDP	Integrated Discovery Program
IHPME	Institute of Health Policy, Management and Evaluation
IP	intellectual property
IUPESM	International Union for Physical and Engineering Sciences in Medicine
JHSA	joint health and safety committee
JLA	James Lind Alliance
JLABS	Johnson & Johnson innovation labs
KOL	key opinion leader
KT	knowledge translation
LIBD	Lieber Institute for Brain Development
LORIS	Longitudinal Online Research and Imaging System
LSO	Life Science Ontario
MassBio	Massachusetts Biotechnology Council
MDAO	Mood Disorder Association of Ontario
MDD	major depressive disorder
MEDEC	Canadian medical technology industry association
MEG	magnetoencephalography
MNE	multi–national enterprise
MNI	Montreal Neurological Institute
MOHLTC	Ministry of Health and Long Term Care
MRIS	Ministry of Research, Innovation and Science
NDAR	National Database for Autism Research
NERD	Neurotech Early Research and Development
NIfTI	Neuroimaging Informatics Technology Initiative
NIH	National Institutes of Health
NIO	Neurotechnology Industry Organization
NIMH	National Institute for Mental Health
OACRS	Ontario Association of Children's Rehabilitation Services
OBI	Ontario Brain Institute
OBIC	Ontario Brain Innovation Council
OBIF	Ontario Brain Institute Foundation
OBIO	Ontario Bioscience Industry Organization
OCE	Ontario Centres of Excellence
OCHIS	Office of the Chief Health Innovation Strategist
OCUR	Ontario Council on University Research

OECD	Organization for Economic Co-operation and Development
OG	Ontario Genomics
OHSA	Occupational Health and Safety Act
OHTAC	Ontario Health Technology Advisory Committee
OIRM	Ontario Institute for Regenerative Medicine
OISE	Ontario Institute for Studies in Education
OLTCA	Ontario Long-Term Care Association
ONDRI	Ontario Neurodegenerative Disease Research Initiative
OSC	Ontario Science Centre
PAC	patient advisory committee
PbD P	Privacy by Design
PET	positron emission tomography
PFAC	patient and family advisory committee
PHI	personal health information
PHIPA	Personal Health Information Protection Act
POND	Province of Ontario Neurodevelopmental Disorders Network
REDCap	Research Electronic Data Capture
QA/QC	quality assurance / quality control
QL/QoL	quality of life
REB	research ethics board
ROI	return on investment
RRI	Rotman Research Institute
rTMS	repetitive transcranial magnetic stimulation
SAC	science advisory council
SIT	science innovation team
SGC	Structural Genomics Consortium
SME	small and medium-sized enterprise
SOP	standard operating procedures
SPReD	Stroke Patient Recovery Research Database
TBI	traumatic brain injury
TECHNA	Institute for the Advancement of Technology for Health
TOR	terms of reference
TRA	threat risk assessment
TRI	Toronto Rehabilitation Institute
UHN	University Health Network
UTI	ultrasonic transcranial imaging
WBI	Weston Brain Institute
XNAT	Extensible Neuroimaging Archiving Toolkit



ONTARIO BRAIN INSTITUTE
INSTITUT ONTARIEN DU CERVEAU

Ontario Brain Institute
438 University Avenue, Suite 1618
Toronto, ON M5G 2K8
(647) 847-9000
1 (866) 637-6301

@OntarioBrain

facebook.com/
OntarioBrainInstitute

linkedin.com/company/
ontario-brain-institute

www.youtube.com/
user/OntarioBrain