ONTARIO BRAIN INSTITUTE | INSTITUT ONTARIEN DU CERVEAU

Funding provided, in part by, the Government of Ontario

January 31, 2021

The Honourable Ross Romano
Minister
Ministry of Colleges and Universities
Toronto, Ontario

Dear Minister Romano,

On behalf of the Chair and Board of Directors, I am pleased to formally submit the OBI Annual Plan for 2021-22. The vision guiding the work of OBI and our partners is to maximize the impact of neuroscience and establish Ontario as a world leader in brain research, commercialization, and care. OBI's collaborative approach accelerates knowledge and innovation from the lab into the community to empower people to become partners in their own care. We will continue to build on our successes to-date and generate research, health and economic impacts for Ontario.

We enjoy and appreciate the excellent relationship with the Ontario Government and look forward to continuing to work together.

Yours sincerely,

Tom Mikkelsen, M.D, FRCPC
President and Scientific Director
Ontario Brain Institute

c.c.
Ms. Shelley Tapp
Mr. Giles Gherson
Ms. Rachel Simeon
Ms. Katherine Kelly Gatten

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January 31, 2021

Shelley Tapp
Deputy Minister
Ministry of Colleges and Universities
Toronto, Ontario

Dear Deputy Tapp,

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Ontario Brain Institute

Annual Plan

2021-2022

January 31, 2021

1 Richmond Street West, Suite 400, Toronto, Ontario M5H 3W4 | T: 647-847-9000 / 1-866-637-6301 | braininstitute.ca

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Ontario Brain Institute Annual Plan
2021-2022
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ONTARIO BRAIN INSTITUTE | INSTITUT ONTARIEN DU CERVEAU

Ontario Brain Institute Annual Plan for 2021-2022

Introduction

The vision guiding the work of the Ontario Brain Institute and our partners is to maximize the impact of neuroscience and establish Ontario as a world leader in brain research, commercialization, and care. OBI's model of integrated discovery achieves impact for patients, accelerates the commercialization of research advances, and changes the research culture. OBI's collaborative approach accelerates knowledge and innovation from the lab into the community to empower people to become partners in their own care. We will continue to build on our successes to-date and generate research, health, and economic impacts for Ontario.

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, government), disciplines (basic, translational, clinical, data science) as well as collaboration and data sharing within and across research programs.

- **Standardization and open science**

We live in the era of digital data. If data are going to be stored and used indefinitely, they need to be of the highest quality, comparable, and secure. Standardization is key, and OBI ensures that data are standardized within and across all of its research programs. In the era of global team science, the principles of open data enable fresh approaches and partnerships. An open science mentality that respects the highest standards of privacy and security ensures that the use of research data is maximized and gives hope to those living with disorders and respect to 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 more than $2 for every dollar that the Government of Ontario invests in us.

This Annual Plan presents the priorities, objectives, activities, milestones and metrics for the 2021-2022 fiscal year in accordance with the 5 Year Operational Plan for 2018 to 2023 and is directly related to the OBI Vision.

This Annual Plan outlines how we will continue the process of integrating research programs within primary care, focusing on the molecular underpinnings of the disorders, scaling-up of the neurotech sector, enhancing data-driven decision making, and embedding patient priorities in the research activities. This document also demonstrates how OBI will continue the implementation of the recommendations to increase its capacity in commercialization and informatics/analytics through Brain-CODE, as well as support the neuroscience community across Ontario.

With the support of the Government of Ontario, OBI is committed to continuing to achieve its milestones and make significant advances towards attaining its overarching goal of making a transformative impact on health, brain research and Ontario's economy.

As per our Vision and Strategic Plan, our priorities are:

- Building a learning healthcare system by integrating research and care and fueling it with next generation informatics and analytics.

- Growing a globally competitive neurotechnology cluster by training highly qualified personnel and working with partners to create a seamless pipeline of support for Ontario companies.

- Improving brain health through shaping better policies with deployment of data-validated innovations and educating the public on brain health.

Below is a description of OBI's key accomplishments in 2020-2021, followed by plans for each priority and operations for 2021-2022, as well as the 2021-2022 Operating Budget. An overview chart bringing together the priority areas, objectives, activities, milestones and metrics is included as an appendix.

2020-2021 Key Accomplishments

Over the past year, OBI continued its focus on better serving the one in three Ontarians who are living with a brain disorder. Our goals of improving brain health and creating economic wealth continue to be supported by our approach to collaborative research, data sharing, new neurotech company formation and community engagement.

In response to COVID-19, the economic and other challenges Ontario is facing, OBI has made it a priority to work with its research programs, the Government of Ontario and other organizations to address urgent issues:

- OBI is participating in the Ministry of Health's (MoH) Ontario Health Data Platform (OHDP) with membership on the Minister's Roundtable led by Dr. Jane Philpot, and on the working groups on technology, data and governance, and Intellectual Property (IP). OBI's informatics platform architecture, governance and privacy guidelines have been imbedded into the OHDP being built at Queens University.
- OBI joined other Ontario research institutions at two roundtable meetings hosted by Minister Ross Romano, Ministry of Colleges and Universities (MCU). The first meeting was focused on data collection and collaboration and the second meeting focused on sharing strategies to fund research and support IP commercialization from the academic and research sector. These roundtables are part of the government's consultation process related to economic recovery after the pandemic.
- With over 100 million cases of COVID-19 worldwide, there is still much to learn about the virus, including its long-term impacts on brain health. Dr. Richard H. Swartz, a clinician-scientist and ONDRI's Co-Director, initiated a global study in June 2020 that aims to understand the direct and indirect effects of COVID-19 on the brain. Dr. Swartz is co-leading the study alongside world renowned neuroscientist Dr. Adrian Owen, with support from researchers at The Brain and Mind Institute at Western University, the University of Toronto, and Sunnybrook Health Sciences Centre.
- The POND Network, OBI's neurodevelopmental disorders research program, and collaborators have been very responsive to the current health crisis precipitated by COVID-19 and emergency measures to limit its spread. They launched the #KidsVSCovid campaign, a fun and simple resource to inform children and youth with neurodevelopmental disorders about what they can do to help stop the spread of COVID-19 (https://pond-network.ca/covid-19/). Four leading child mental health research teams (1. SickKids Child and Youth Psychiatry Outpatient

Program, 2. POND, 3. The Applied Research Group for Kids (TARGet Kids!), and 4. Spit for Science) joined forces to understand impact of the COVID-19 pandemic emergency measures on the mental health of children and families. This first-time collaboration leverages POND infrastructure but also received funding from CIHR and Ontario MoH. The scope of this work includes examining a virtual mental health stepped care approach to addressing needs of at-risk children and families, studying the feasibility and acceptability of the virtual Interact-North parenting program, addressing mental health challenges associated with the COVID-19 pandemic in children with ASD/ADHD and deliver and evaluate a virtual intervention to help treat acute anxiety among autistic youth caused by social isolation during the COVID-19 outbreak.

- OBI's depression program, CAN-BIND, launched a study to assess the impact of COVID-19 pandemic on their Wellness Study cohort. They are re-contacting participants for periodic assessments on the impact of the COVID-19 crisis on their depressive symptoms, perceived stress, alcohol and substance use screening/patterns of use, as well as any COVID-19 specific stressors (e.g., finances, health, grief, social isolation).
- OBI completed a review of the new changes to Government's privacy legislation and provided advice on their effectiveness and potential further changes that could be considered. The recommendations support enhanced data sharing while still maintaining privacy and are significantly important during this time of the pandemic.
- Researchers from OBI's depression research program, CAN-BIND, met with the Ontario Health's Mental Health and Addictions Centre of Excellence to discuss how researchers can help with evaluation and deployment of positive research outcomes for novel depression treatments.

An integrated and collaborative approach to science is the cornerstone of OBI's work. We continue to work towards a learning healthcare system, improving health, building community, and creating economic opportunities through this approach. Our strength lies in our ability to support quality research based on scientific excellence that advances our understanding of brain disorders. To date, OBI's research programs have collectively attracted over $108 million in additional research funding, from national and international sources, to advance brain research. This year:

- OBI initiated a cross-Integrated Discovery Program (IDP) research study looking at sleep in children across different brain disorders using common data elements collected through Brain-CODE. This is part of our efforts to facilitate collaborations and to demonstrate the value of the standardized data collection.

- The ONDRI@Home team made good progress on remote monitoring for persons with neurodegenerative disorders. They evaluated commercial wearables, collected feedback from both caregivers and clinicians, leveraged grants and ongoing initiatives to validate results and attracted industry partners. Algorithms are currently being developed to inform wearable measures.
- OBI and partner companies sought out Federal Government funding for an initiative to help frail individuals remain in their homes for as long as possible. The Digital Technology Supercluster formally announced the funding of our Consortium-based application - the Healthcare to Homecare project created by OBI and several wearable technology companies, including XCO Tech, a leading-edge wearable technology based in British Columbia.
- The updated version of the Epilepsy Clinical Management guidelines has been released. The updated guidelines will be used by Ontario doctors in deciding how to treat patients with epilepsy. They contain updated evidence-based recommendations on drug treatment, women with epilepsy, SUDEP, depression, stigma, and psychogenic non-epileptic seizures.

OBI is engaged in collaboration and data sharing to break down the silos in research and help decrease the time it takes for discoveries to move from the lab to life. Data sharing and data linking through Brain-CODE, OBI's large-scale health database, continue to be one of OBI's unique differentiators from other research funding agencies. OBI is working to enhance the value of Brain-CODE data holdings for our local research community and create a new resource for the international brain research community. The Brain-CODE platform currently supports over 1500 users in the gathering and sharing of research data. With data from over 21,000 study participants, secured with the highest privacy standards, Brain-CODE's data repository continues to attract international attention.

- The Brain-CODE governance policy has undergone thorough expert review to facilitate data releases to third party researchers. The updated policy is now posted and shared with Research Ethics Board (REBs), Privacy Officers, and Contracts Offices. We are preparing to open the first clinical research datasets from our IDPs to the international research community and expect significant interest considering the number of requests for access to the earlier non-clinical data releases.
- In partnership with Roche, OBI hosted a webinar on digital biomarkers in neuroscience featuring Dr. Charles Alessi from the Healthcare Information Management System Society. This event follows up a previous webinar OBI hosted in May. This event focused on Ontario's competitive advantage for developing and implementing digital biomarkers given OBI's infrastructure, ICES, and the recent development of the Ontario Health Data Platform.

- OBI is developing an electronic consent process for Brain-CODE that will help IDPs with streamlined patient recruitment as well as virtual patient recruitment during the pandemic. The privacy and security protections are being discussed with REB Chairs.

OBI is working with companies commercializing research that will help patients with brain disorders. This includes the development of entrepreneurial skills to help new companies develop faster, supporting companies through start-up phases, and linking companies to various management and advisory services. To date, OBI has supported commercialization activities for 81 companies and has trained over 60 ONtrepreneurs.

To date, more than 20 OBI-supported companies have launched their products into the Ontario marketplace to directly impact the brain health of patients. This year, neurotech companies such as Wellbi (social interactions in long-term care facilities), Steadiwear (essential tremor intervention for home use) and Village Tech (Babbly a home-based monitor for infant's developmental milestones) are now able to market their technologies to patients in Ontario. Of particular note:

- Awake Labs, a wearable for detecting anxiety and big emotions in adults living with intellectual disability, is now available for reimbursement through the Ontario Government's Passport program.
- Trexo Robotics, an exoskeleton to help children with cerebral palsy walk, is now available for reimbursement for clients of a Florida-based state program that provides lifetime support and care to families with children affected by catastrophic birth-related neurological injuries.

The 9th cohort of OBI ONtrepreneurs was selected and onboarded. Three of the four companies have direct ties to the OBI research network demonstrating the value of this program to help with the commercialization of research. The ONtrepreneurs selected include:

- Christopher Ahuja (Inteligex) - a healthcare company that provides precision cellular and molecular therapies for degenerative diseases of the brain and central nervous system. This technology was developed in the lab of Dr Michael Fehlings who is part of OBI-supported CP-NET, a research program focused on cerebral palsy.
- Iana Dogel (TeleMag Health Solutions) – a healthcare company developing a portable repetitive transcranial magnetic stimulation (rTMS) device that can deliver the same efficacy as the clinical rTMS devices.
- Rozhin Yousefi (CerebTalk) - a brain-computer interface company developing a technology specifically designed for people with severe motor impairments to

provide them with a practical and universal means for controlling various electronic devices. This technology was developed in Dr. Tom Chau's lab at Holland Bloorview.
- Matthew Rosato (PROVA Innovations) - a medical start-up focused on developing smart, at-home, wearable therapeutic devices that aid in neuro motor control and neurorehabilitation in children and adults suffering from brain injuries that have caused mobility restrictions. The technology and the ONtrepreneur are associated with the Dr. Jan Willem Gorter's lab, from CP-NET.

At OBI we take a great deal of pride in helping to take the innovative work that happens in the confines of a lab and translating it into real life – ultimately better supporting individuals with brain disorders as well as their families and caregivers. Engaging and empowering the public to improve care is an important part of this. Already this year, OBI has reached over 100,000 people through its outreach and public education initiatives. Here are some highlights:

- OBI's first public talk of the year, 'Mindfulness in Stressful Times', was held virtually due to COVID-19. It was hosted in partnership with the Ontario Science Centre and drew an audience of over 500 individuals. In the second talk, "Dealing With Depression – What Are Your Options?", OBI presented a live panel discussion of the many treatment options for depression, coinciding with Mental Illness Awareness Week. We had 353 registrants including 53 international ones. The Associate Minister of Mental Health and Addictions, Michael Tibollo, provided opening remarks, outlining Ontario's efforts to tackle mental health challenges. The third talk focused on the importance of data sharing in healthcare, drawing in over 250 attendees.
- The 7th annual Patient Advisory Committee workshop was held with 67 representatives from the IDP patient advisory committees. The workshop focused on sharing their successes and challenges related to patient partnerships in research. We also got input from the patient representatives to shape our approach to community-based neurotech testing. Feedback from these sessions will be used to fine-tune our patient engagement processes.
- CP-NET held their 8th annual Science & Family Day, coinciding with World CP Day. This year's event was held virtually in response to the current pandemic and attracted an international audience with at least eight countries aside from Canada represented. This event provided updates on CP-NET research to the CP-NET stakeholders and the broader community, featured keynotes from the Ontario Minister of Health, Christine Elliot, CP-NET and international researchers, and shared information on OBI's brain research database, Brain-CODE.

- OBI concluded an evaluation of the Stories from our Roots project, a MoH-funded life promotion program for First Nations youth. The project created a safe space for participants, built strength and resiliency, deepened connections and their sense of belonging, and provided capacity building and new opportunities.

OBI has committed to leveraging the $200 million in funding to match the $100 million provided by the Ontario Government. In less than three years, OBI has accumulated $179 million and has already met its 2021–22 target.

Leveraging Chart

Fiscal Year	Target	Leveraged
2018/2019	$40 million	$40,000,000
2019/2020	$40 million	$40,000,000
2020/2021	$40 million	$40,000,000
2021/2022	$40 million	$40,000,000
2022/2023	$40 million	$18,877,802
Total	$200 million	$178,877,802

In the coming year OBI will continue to build upon our success to date and through our collaborative model ensure we achieve improvements in healthcare and economic opportunities through integration, collaboration, data sharing and building community.

2021 – 2022 Operational Plans

Priority: Build a Learning Healthcare system

OBI is uniquely poised to help build a learning healthcare system - by integrating research and patient care and moving research from the lab and clinics into the community. The learning health care system embeds research into patient care and ensures that research findings are translated into evidence-based clinical practice and health system change to bring about real patient and economic impacts. OBI's research is focused on gaining a deeper understanding of brain disorders and is yielding new insights into the underlying mechanisms of disease.

The IDPs are large-scale multi-disciplinary, multi-institution collaborative efforts that bring together researchers, clinicians and industry partners, as well as patients and their advocates. Their goal is to drive patient-focused, high impact research across multiple sites, disciplines, and sectors. They are built on the underlying principles of research excellence, patient focus, integration, standardization and translational drive.

OBI will continue to fund and manage six pan-Ontario multidisciplinary research programs in the areas of cerebral palsy, epilepsy, depression, neurodegenerative disorders, neurodevelopmental disorders, and concussion.

Through the performance management framework, OBI will ensure that the activities of the IDPs are aligned with OBI's Vision by the ongoing monitoring and evaluation of the programs against the milestones set for each program. OBI will be supported in these efforts through the scientific, industry, patient and community advisors that are critical to our approach. These advisors provide advice and actionable milestones to ensure scientific excellence, economic impact, and patient impact of the IDPs. The IDPs enable us to build on Ontario's key neuroscience assets and address areas of brain disorders that have a very large personal, societal, and economic burden.

OBI will ensure that the programs continue to adhere to the IDP research principles:

1. A focus on internationally ranked, leading edge science
2. A focus on the patient
3. Integration (across sectors, sites, and disciplines)
4. Standardization
5. A translational thrust

OBI's research is focused on gaining a deeper understanding of brain disorders and will yield new insights into the underlying mechanisms of disease. OBI is committed to the idea of using this research to drive improvements in health. Therefore, we work to ensure that as research advances our knowledge of brain disorders, the public benefits through better diagnosis and screening, new treatments, and updated policies. This includes increased translation of research into new treatments and tools, enhanced patient-care through evidence-based practice, faster movement of research findings to patients, and increased public access to information about brain research, brain disorders, tools, and treatments.

OBI has built one of the most comprehensive and secure brain research databases in the world, Brain-CODE. OBI's research contracts with universities and research hospitals across Ontario provide agreement for data to be stored in Brain-CODE. This level of data

harmonization and sharing is unprecedented among institutions nationally and internationally. As the number of participants and the richness of data continues to grow within Brain-CODE, the potential to leverage these data (i.e., through federations with other national and international databases) grows exponentially.

The pristine and well curated datasets in Brain-CODE are of considerable value and create both improved healthcare and economic development opportunities. Its primary purpose will still be to support our researchers, but it also supports national and international opportunities to provide a consistent and secure approach to data collection including management, storage, and analysis. Privacy and security remain at the forefront of the initiative and the sharing of data will be based within the context of international standards.

National and international data sharing opportunities will be pursued. The continued development, improvement and support of Brain-CODE will be a key priority of OBI in the coming year. Much of the new development will take place through funds that will be generated through the participation in national and international activities where grant or contract funding will be possible. OBI will also continue to build a strong research network by using the same common data elements (CDEs).

Objective: Ongoing management of six current IDPs, ensure alignment with OBI Vision and adherence to the OBI model

OBI continues to work with each of the IDPs to ensure that they operate consistent with OBI's strategic priority to create a learning healthcare system with funding and activities that are in alignment with the OBI model as recommended by the External Review.

Each of the IDPs has developed a logic model that highlights the short-term outputs and long-term goals of the program. This logic model and the implementation of the performance management framework will enable us to keep the IDPs focused on prioritized activities (e.g. those with healthcare impacts). We will continue to hold quarterly Strategic Planning meetings with each program to allow for joint planning and to monitor milestone progress. In cases where there is a failure to meet milestones or to adhere to the OBI model, these meetings will provide an opportunity to provide warnings and adjust accordingly.

OBI has developed and implemented a performance management framework (IDP Snapshot) that is based on its logic model. We are now working with each IDP to utilize their logic models to inform budgets, timelines, milestones, and deliverables. This

updated performance management framework will create clear linkages to the Programs and the health and economic impacts that they will achieve.

The IDPs' clinical framework will continue to drive OBI's approach to creating impact. OBI funding will continue to reflect this and will not duplicate or replace what other funding agencies provide. OBI's support of basic science will be limited to reverse translational research that is closely tied to the clinical component and thus contributes to development and validation of models and/or biomarkers.

With the evolution of OBI's commercialization programs and of Brain-CODE, OBI must be poised to help develop the growing number of Ontario data companies through validating their software platforms and algorithms. In addition to supporting our research community, as mentioned earlier, this will help to further build the artificial and machine learning capacity in Ontario and keep Ontario at the leading edge of this field.

Milestone	**Activity**	**Metric**
Develop a plan to implement and track standard assessments, beyond Brain-CODE CDEs, across all IDPs	Further assess data that has been collected through Brain-CODE clinical CDEs and expand existing dashboards to incorporate more information about nature of data collected through Brain-CODE CDE assessments	# of IDPs with standardized clinical framework # of participants with Brain-CODE CDEs
Identify opportunities and create plan for cross-IDP collaboration	Complete two pilot cross-IDP CDE projects: • Paediatric sleep (POND, CP-NET, EpLink) • Comorbid depression in neurodegenerative disease (CAN-BIND, ONDRI)	# of cross IDP collaborations # of projects/ proposals using Zone 1 data
Conduct annual bibliometric analysis on IDP publications	Assess quality and impact of IDP publications from 2020	# and quality of publications

Objective: Active testing of biomarkers in the community care setting

Our IDPs are innovating within the healthcare delivery system where people are cared for. This involves providing validated, data-driven interventions by integrating research and care, moving research from the lab into the community, and creating a true learning healthcare system that results in continuous quality improvement. For example, initiating partnerships with Ontario family health teams where discovery (e.g., new biomarkers) from the research laboratory can be translated and tested in the primary care setting where innovations and quality improvements are either quickly discarded or scaled, as appropriate.

Milestone	Activity	Metric
Continue ONDRI@Home	Continue support for data upload and data sharing for ONDRI@Home studies	# of study participants with data in Brain-CODE
Continue biomarker testing for depression	Continue support for data upload and data sharing for CAN-BIND validation study	# of study participants with data in Brain-CODE
Initiate a new biomarker trial in other IDPs	Provide informatics support for new studies: • HANDDS-ONT in neurodegenerative and dementia cohorts • Epileptic Encephalophy Registry, to support rare forms of epilepsy • Whole Genome Sequencing in neurodevelopmental, dementia and cerebral palsy cohorts • Fluid biomarker analysis in dementia cohorts • Quality Improvement initiatives in cerebral palsy, to inform diagnostic guidelines and quality of life	# of clinical trials

Objective: Advanced analytics for disease modeling and diagnostics

Data science, machine learning and artificial intelligence are areas of increasing importance to research, healthcare, and economic development. Consistent with recommendations from the OBI Wide External Review Panel, OBI is proposing to expand its data sciences focus by building on its existing informatics and analytics platform Brain-CODE to:

- provide world class informatics tools based in artificial intelligence and machine learning to support the IDPs.
- provide data, analytical workspaces, and tools to engage the broader neurosciences community – nationally and internationally in the analysis of data.
- engage industry to stimulate the development of new intellectual property, tools and treatments.
- strengthen its relationship with the Vector Institute and the Toronto Machine Learning Series to stimulate the development of new analytical tools and algorithms to be included in Brain-CODE,and support the creation of new companies and new products for existing companies to add to the marketplace.

OBI is an associate member of the Digital Technology Supercluster consortium of industry participants, academia and not for profits on a national basis who have been awarded funding under the federal supercluster initiative. OBI will continue to be a key component of the Precision Health Pillar in this supercluster. OBI has already been involved in a successful application in collaboration with the Autism Sharing Initiative. The application's aim is to connect national and international autism databases while adhering to standards from the Global Alliance for Genomics and Health (GA4GH). GA4GH is a policy-framing and technical standards-setting organization, seeking to enable responsible genomic data sharing within a human rights framework.

Milestone	**Activity**	**Metric**
Ongoing development of new IP, analytic tools, and treatments through participation in Digital Technologies SuperCluster	Continue involvement with Supercluster projects: • Development of a Frailty Care System with XCO and the Home to Healthcare Consortium • Autism Sharing Initiative to develop a patient-centered research platform with DNAStack, POND, Autism Speaks Canada, and Roche.	# of projects/ proposals using Zone 1 data

Develop new IP and analytic tools for Brain-CODE through grants, partnerships with industry and AI experts, and IDP development	Continue to work with analytics groups and industrial partners on opportunities to expand analytics capabilities of Brain-CODE	# of projects/ proposals using Zone 1 data

Objective: Quality improvement processes for healthcare

Building a learning healthcare system involves integrating research in the primary care setting. This is where most people with brain disorders receive their care. OBI is working with each of its IDPs to create partnerships with frontline service organizations, including primary care e.g. MINT Memory Clinics, Project ECHO, ECT-Ketamine study, ONDRI@Home, First Nation communities, Empowered Kids Ontario, where discovery from the clinical research program is immediately applied into the local care setting.

Milestone	**Activity**	**Metric**
Establish partnerships between each IDP and frontline care providers	Support the implementation of IDP evidence/research pilots in partnership with care providers	# of partnerships between IDPs and frontline care organizations
Measure health outcomes from IDP front line care partnerships	Use Brain-CODE data to identify quality improvement projects from IDPs and support their implementation into the health/care system	# of quality improvement projects

Objective: New Treatments

The IDPs' clinical framework will continue to drive OBI's approach to achieving impact. OBI funding will continue to reflect this and will not duplicate or replace what other funding agencies provide. OBI's support of basic science will be limited to reverse translational research that is closely tied to the clinical component and thus contributes to development and validation of models and/or biomarkers.

Milestone	Activity	Metric
Catalyze clinical trials and clinical validation studies through IDPs	Continue to support ongoing clinical trials • CAN-BIND: ECT-Ketamine study for major depressive disorder • CAN-BIND: biomarker validation trial • POND clinical trial network: Rett Syndrome • ONDRI: deployment of HANNDS-ON, a platform for clinically validating neuro-technologies in the home	# of clinical trials

Objective: National and International data sharing and linkages

The Brain-CODE platform is unique in its ability to facilitate both external collaborations to enhance Ontario's research system and link with health administrative data for more effective health outcomes. All IDPs have now provided Exclusivity Plans on how they would like to see datasets from their respective studies released to external third-party researchers.

On a national level, Brain-CODE has supported the sharing of data sets from OBI's neurodegeneration program, ONDRI, with the Canadian Consortium for Neurodegeneration in Aging (CCNA), whose data is housed on McGill's Longitudinal Online Research and Imaging System (LORIS) system.

Brain-CODE continues to be used by the Centre for Addiction and Mental Health (CAMH), which has established a centralized database powered by Brain-CODE for research being conducted at the institute. OBI and CAMH are exploring the possibility of co-developing data models and improving data integration functionality. In addition, Brain-CODE is a key element of the broader Canadian Open Neuroscience Platform (CONP), an infrastructure that is being funded in part by a Brain Canada grant. OBI is an active member of the CONP Technical Steering Committee and CONP Data Governance and Ethics Committee. OBI will continue to provide support in the development of the CONP data portal and related policies and guidelines.

Brain-CODE is a critical link between research, healthcare and economic development. The pristine and well curated datasets in Brain-CODE are of considerable value and create both improved healthcare opportunities and economic development

opportunities. Critical to this is the linking of the deep data that comes from OBI's IDPs with the broad health administrative data that is contained at the ICES and within electronic medical records.

OBI and ICES have successfully linked datasets in order to create an algorithm that will enable OBI/ICES to determine the health administrative costs of children with autism spectrum disorder. Two other successful linkages have also been completed in the areas of (i.) a ketogenic diet study for patients with epilepsy, (ii.) screening for depression, obstructive sleep apnea and cognitive impairment to identify stroke clinic patients at risk of adverse outcomes.

From these pilot linkage studies, it has been determined that OBI and ICES are poised to implement an approach to data sharing to demonstrate the value of digital phenotyping and impacts of potential changes on the health care system. OBI and ICES are in the process of implementing a routine linking protocol encompassing all participants on Brain-CODE to allow for more immediate linkages.

Milestone	**Activity**	**Metric**
Continued involvement in work related to the CONP as a mechanism to engage with the broader neuroscience community – nationally and internationally	OBI is currently involved with the CONP as members of the Technical Steering Committee, Ethics and Governance Committee. We will assess future opportunities based on potential for impact.	# of Zone 3 data access requests
Ongoing data releases from IDPs	Release data from IDPs to external researchers for secondary use	# of Zone 3 data access requests
Complete Brain-CODE ICES backbone linkage	Complete the backbone linkage between Brain-CODE and ICES and initiate two studies using the linkage Work with IDPs to prioritize projects utilizing the linkage	# of linkage projects

Objective: Full implementation of recommendations from OBI Wide External review to ensure a world class informatics platform to support the IDPs

The OBI Wide External Review recommended the development of a new data science strategy that was inclusive of researchers outside of the research programs. Additionally, OBI was advised to leverage existing platforms and ensure user and market demand drove development rather than the technology itself. Stemming from this, OBI created a 5-year Strategic Plan for Brain-CODE with five priority areas. These areas focus on expanding Brain-CODE's capabilities in informatics, governance, and analytics to ensure that a world class platform is in place to support the IDPs, as well as participating in national and international informatics initiatives.

Milestone	**Activity**	**Metric**
Initiate execution of Brain-CODE strategic plan and build into 2021-2022 Statement of Work with indoc	Implement the five priority areas of the 5-year Strategic Plan for Brain-CODE • Strategy and Planning • Platform Operations • Security, Privacy, & Ethics • Analytics, Data Science, & External Linkages • Partnerships & Business Development	# of Brain-CODE users # of Zone 3 data access requests % growth in Brain-CODE users and capacity

Priority: Growing a Globally Competitive Neurotechnology Cluster

OBI is growing a globally competitive neurotechnology cluster by training highly qualified personnel and working with partners to create a seamless pipeline of support for Ontario companies. OBI strives to catalyze the collaborative approach to supporting Ontario companies by working with entrepreneurs and companies across Ontario and in the broad neuroscience community. OBI has now completed nine rounds of the ONtrepreneurs program and will continue to support neurotech entrepreneurs.

To address the need for increased capital in Ontario's neurotechnology cluster and to support small and medium sized enterprises, OBI will continue the Neurotech Early Research & Development (NERD) funding program. This program funds product development or testing at Ontario-based Contract Research Organizations on behalf of selected companies that have an engaged follow-on investor, to address development gaps or the valley of death as it is sometimes referred to. OBI will continue to operate the NERD program as a lending-based program, providing opportunities for OBI to benefit from the resulting company growth.

OBI will forge strong relationships with local, national and international partners to attract investments and to make Ontario a globally-recognized neurotechnology cluster. Through this approach OBI will work across Canada and internationally to engage with the broader neuroscience community.

OBI continues to support the growth of the NeuroTech Ontario cluster ecosystem and foster collaborations between industry, institutions, and other innovation-based organizations. Activities and events are organized to engage the cluster's players as well as attract experts and resources from outside the ecosystem. To track the resources in the neurotech cluster, OBI has continued to update and make improvements to its AXON Atlas for Ontario Neuroscience (AxON) – an application that provides information on the broader neuroscience community in Ontario.

The goal moving forward is to have several strategic partnerships with both large multinational enterprises and mid-size biotechnology companies that establish OBI as a preferred product development partner. These relationships may lead to a variety of collaborations including the validation of neurotech-based clinical trial outcome measures and the creation of joint ventures with Ontario companies.

Developing management skills in neuroscience graduates is necessary to support growth in the regional neurotech cluster, its existing and new companies, and to improve the quality and competitiveness of human capital. OBI is growing Ontario's

neuroscience management talent through the entrepreneurship and internship programs. These programs support Government of Ontario objectives related to training, innovation, and healthcare improvement through technology development.

Objective: Scale up small companies

OBI strives to catalyze the collaborative approach to supporting Ontario companies by working with entrepreneurs and companies across Ontario and in the broad neuroscience community. OBI will continue to support neurotechnology cluster development through its internship, entrepreneurship and NERD programs, and will use national partnerships to expand its capacity.

To address the need for increased growth capital in Ontario's neurotechnology cluster and to support small and medium sized enterprises, OBI will scale up the NERD funding program and work with the investment community to address development gaps or the 'valley of death' as it is sometimes referred to.

Milestone	**Activity**	**Metric**
Continue with scaled up NERD program	Continue to run NERD to assist neurotech companies with their product development/clinical validation needs Submit a full application to the Stream 5 Strategic Innovation Fund (SIF) program to fund a national Canadian Neurotech Support (CNS) Network	NERD follow-on investments # of NERD companies

Objective: Attract and develop new management talent and increase employment in the neurotech cluster

The ONtrepreneurs program is Canada's single largest award that catalyzes early-stage entrepreneurs to commercialize brain-related technologies by accessing funding and support to launch or grow their neurotechnology ventures. OBI will continue this program.

OBI will also support internships at OBI or at industry and institutional partner organizations across the province through the innovation-based internship program. The combination of OBI funding and matching funds from the partner organizations makes for particularly attractive internships and helps facilitate "off the bench" experiential training for recent graduates. In addition to the valuable training opportunity, the

internship program provides start-ups with valuable human capital to help grow the company. Many of the interns find full-time employment with their placement organization, which is helping to build management capacity within the NeuroTech cluster.

Milestone	Activity	Metric
Continue ONtrepreneurs program	Run 10th cohort of the ONtrepreneurs program to strengthen the neurotech cluster in Ontario and develop new management capacity for neurosciences Submit a full application to the Stream 5 SIF program to fund a national Canadian Neurotech Support (CNS) Network	ONtrepreneurs follow-on investments # of ONtrepreneurs
Prioritize Internship support for industry-based clinical validation studies	Place up to 10 interns in roles that will assist with the clinical validation and adoption of neurotechnologies	# of interns per year % follow-on employment # of new co-funders or cluster partners

Objective: Procure homegrown products into the healthcare system

Innovations arising from the IDPs have the potential for economic impact through cost-savings to the healthcare system. OBI will work with innovation partners in new technologies and companies coming through our programs. OBI will catalogue the IDP technologies to determine market readiness and suitability for the Ontario healthcare system. For technologies that are poised for healthcare impact, OBI will work with our network of clinicians, companies, patient groups and policymakers to provide a comprehensive case for adoption to the MoH.

Milestone	Activity	Metric
Work with innovation partners in new technologies and companies coming through our programs	Complete the first community-based neurotech testing project for epilepsy and initiate a second community-based project Develop a plan for a community-based neurotech testing program	# of products to market # of strategic partnerships with MNEs/funders # of companies/IDP partnerships developed

Objective: Engage with the broader neurotech cluster

OBI integrates research with industry for economic impact. The commercialization activities of OBI's neurotech cluster initiatives will continue to include scientific and clinical validation, user feedback, and the Internship, ONtrepreneurs and the NERD Programs to support the growth of neurotechnology companies across Ontario and the incorporation of these Ontario-based technologies into the Ontario healthcare system.

Several recent Phase 3 clinical trial failures resulted in many multi-national enterprises pulling out of the neuroscience space and spinning out venture-backed biotechnology firms to develop their neuroscience assets. Therefore, OBI will continue to engage multi-national enterprises and will expand our scope to include mid-size biotechnology companies to help secure further partnerships for our IDPs. Examples of partnerships may include target validation, data analysis, clinical trials, and reuse of clinical trial samples.

OBI plans to expand its lead role in developing brain health products in terms of increasing the funding level and developing formal relationships with co-funding and follow-on funding partners across Canada and globally. OBI will engage in fund raising initiatives to increase the funds available to work with the neurotech community across Ontario. Through this approach OBI will work across all of Ontario and engage with the broader neuroscience community.

The goal moving forward is to have several strategic partnerships with larger multinational enterprises (MNE) and/or mid-size biotechnology firms to establish OBI as a preferred product development partner. These relationships may lead to a variety of collaborations including clinical trials and the co-founding of Ontario companies.

Milestone	**Activity**	**Metric**
Increase interaction between companies and IDPs	Work with the IDPs to initiate new clinical validation studies	# of company/IDP partnerships developed
Increase integration with company support programs across Ontario	Continue to identify and build relationships with provincial and national partners who will help us scale our neurotech supports across Canada Continue to promote Ontario's NeuroTech Cluster, OBI commercialization programs, and companies to investors	# of CROs engaged # of new co-funders or cluster partners
Categorize and consider expansion of focus of the OBI portfolio companies	Work with researchers/clinicians in OBI's network to evaluate and validate technology, and support the growth and scale of companies	# of portfolio companies # of new companies supported over the 5 years
Increase NeuroTech cluster promotion	Develop and implement a marketing and communication strategy for the NeuroTech cluster	Global recognition of the NeuroTech cluster demonstrated by the engagement of international companies and investors
Develop process for neurotech companies to work with EEG data from IDPs	Work with IDPs and neurotech companies to assess opportunities for secondary use of EEG data	# of companies engaged with EEG data from IDPs

		Process mapped out
Investigate the potential for consolidation of similar IP/technologies across research institutions participating in the IDPs	Work with the OBI network to initiate clinical validation studies	# of clinical validation studies undertaken

Priority: Improving Brain Health

OBI is focused on getting research findings to patients faster, improving public access to reliable information about brain research, brain disorders, tools and treatments, and building stronger connectivity with research, industry, and patients. OBI continues to involve the broader research, clinical, industry and community advisors in the process of getting the messages out about the results of the research and commercialization, the potential successes and celebrating the opportunities for improvements in healthcare.

OBI is engaging patients and public in neuroscience research and their brain health by fostering knowledge translation and exchange and facilitating linkages between researchers and decision-makers for the uptake and use of evidence through the Patient Advisory Committees, partnerships with other organizations and publicly accessible events like our public talks.

OBI involves patients, care partners/givers and advocates in research by integrating the patient voice in research through the Patient Advisory Committees for each IDP which meet quarterly. OBI will continue to host an annual Patient Advisory Committee workshop.

OBI is evaluating the impact of investments by refining and implementing the evaluation plan it developed in conjunction with the Outreach Advisory Committee involving global leaders in evaluation, knowledge translation, and public engagement.

OBI has launched the GEEK (Growing Expertise in Evaluation and Knowledge Translation) program, which provides funding, evaluation expertise, and support to community-led programs and services for people living with brain disorders. GEEK supports the sustainability, scale or spread of these programs, to improve the quality and quantity of

evidence-based care in the community. OBI is now supporting the two cohorts of GEEK awardees to spread and/or scale and evaluate the impact of their programs in Ontario.

Objective: Data-driven decision making/policies

OBI engages government and policy makers to ensure that research informs policy and policy informs research by imbedding OBI staff and researchers within Government of Ontario projects. Through this mechanism OBI ensures that the research results are directly aligned with government strategies for improved care.

Brain-CODE is a critical link between research, healthcare and economic development. Brain-CODE datasets are of considerable value in terms of both improved healthcare opportunities and economic development opportunities. Critical to this is the linking of the deep data that comes from OBI's IDPs with the broad health administrative data that is contained at ICES and within electronic medical records.

Milestone	Activity	Metric
Leverage network of experts for policy discussions on brain health and link to government priorities	Continue building relationships with key government stakeholders and share approaches that can support government priorities	# of policies impacted
Ongoing work to develop codes for capturing autism and depression in administrative data	Work with IDPs, ICES, and other health system partners to develop algorithms for health system surveillance	# of algorithms developed

Objective: Patient research priorities addressed in research

OBI engages patients and public in neuroscience research and their brain health by fostering knowledge translation and exchange and facilitating linkages between researchers and decision-makers for the uptake and use of evidence through the Patient Advisory Committees, partnerships with other organizations and publicly accessible events like our public talks.

OBI will involve patients, care partners/givers and advocates in research by continuing to integrate the patient voice in research through the Patient Advisory Committees for each IDP which meet quarterly. OBI will continue to host an annual Patient Advisory

Committee workshop. OBI has helped to build lasting relationships between its research programs, and patient advocacy groups. Due to the stable and long-term funding of these research programs, meaningful partnerships between researchers and neurological charities have been created and expanded.

In total, OBI has created partnerships with 29 patient advocacy groups or service providers. Of those, 18 are involved with the six IDPs as members of their Patient Advisory Committees.

Through strategic outreach activities (past examples include MINT Memory Clinics and Minds in Motion), OBI will translate research into improved efficiencies in health care service delivery and facilitate linkages between researchers and decision-makers for the uptake and use of evidence.

Milestones	**Activity**	**Metric**
Support patient partnership activities across research process	Continue to facilitate patient partnership by aligning patient interests and IDP needs.	# of patient partnership activities # of patients and families engaged in family and science days
Finalize epilepsy research priority setting partnership	Work with EpLink to host the final Epilepsy Priority Setting Partnership workshop, complete the final report and publicize the findings with the broader research and epilepsy communities for adoption	Final report on priorities

Objective: Community-based implementation pilots

OBI will continue GEEK a program that supports the scale and spread of community-based initiatives that provide care and support for those living with a brain disorder (e.g., system navigation, family and patient education, etc.).

OBI will also work with the Chiefs of Ontario to seek the further scaling of a youth suicide prevention program to First Nation Communities, helping to support a province-wide mental wellness initiative for Indigenous youth.

OBI will initiate a process for testing neurotechnology in the community in partnership with patient advocacy groups. This will allow patients to get access to potentially impactful products to support brain health and provide valuable community feedback to the companies to help with ongoing product development.

Milestones	**Activity**	**Metrics**
Continue GEEK program	Support the two ongoing GEEK cohorts and open a new round of applications to the program Create more training opportunities for community organizations to build capacity in evaluation	# of partnerships with frontline care # of new partnerships developed
Scale Indigenous mental health and wellness programs (ongoing, new partnerships)	Support life promotion/suicide prevention for First Nations youth through our partnership with Chiefs of Ontario Continue building relationships with Indigenous partners to support scaling entrepreneurship/innovation for Indigenous communities	# of new partnerships developed
Work with innovation partners in new technologies and companies coming through our programs	Complete the first community-based neurotech testing project for epilepsy and initiate a second community-based project Develop a plan for a community-based neurotech testing program	# of products to market # of projects with companies

Objective: Cost-effective healthcare outcomes and interventions

OBI will work with each of its IDPs to ensure that new knowledge generated by the IDPs is shared with the public and patient communities. Through various channels including

websites, videos, and social media, OBI and IDPs will create a steady stream of actionable information about brain research and brain health.

Milestones	Activity	Metrics
Develop, disseminate, and evaluate tools to promote brain health	Continue to work with the IDPs to promote the dissemination and implementation of research findings	# of plain language summaries from our research programs

Objective: Health system planning using research and administrative data

OBI intends to update the report "Brain Disorders in Ontario: Prevalence, Incidence and Costs from Health Administrative Data" produced in partnership with the ICES. As a first step we are working to develop codes that will identify brain disorders that are currently unidentifiable through administrative data, such as autism. The first version of the report is being used by several patient advocacy groups and health planning units as a resource, including Epilepsy Ontario, Parkinson Canada, and Ontario community epilepsy agencies. This report is one of the most frequently cited Applied Health Research Question reports produced by Institute of Clinical Evaluative Sciences.

Milestone	Activity	Metric
Update brain disorders in Ontario report using health systems data	Work with ICES to refresh the Brain Disorders in Ontario report outlining prevalence, incidence, and costs of various brain disorders in Ontario	New report released in 2021-2022

Objective: Self-management of health

OBI continues to embrace the concept of lab to life and undertakes various activities that connect the outputs of its research programs to the general public and help individuals manage their heath. These include:

- building KT capacity and supporting research programs in developing knowledge products and events for the general public.
- hosting public talks that address stigma, empower people with lived experience, and educate the public.
- creating awareness campaigns as part of Brain Awareness Week and other opportunities addressing stigma, facts and myths about people living with brain disorders.
- providing information on OBI supported research on the website, blog, and social media channels.
- inviting applications for OBI's Event Funding program to support events and activities from the neuroscience and brain health community.

Milestones	Activity	Metric
Host four OBI Public Talks to educate and inform public	Host four public talks to inform, educate, and empower people with actionable information	# of people that we engage in our research programs both online and in person

Operations

The administration area provides support to OBI program areas in implementing their activities, as well as ensuring that OBI meets its corporate obligations including legislation, accounting standards, and commitments to funders. This includes activities in the areas of reporting and operational planning, procurement, management controls, human resources, and governance. Administration will work to ensure that OBI is a corporately responsible, well organized company under the new contract.

Objective: External Review

OBI is in the process of completing its mid-term review led by two co-chairs. Dr. Paul Matthews who is Head of the Department of Brain Sciences in the Faculty of Medicine of Imperial College London and a Director of the UK Dementia Research Institute at Imperial College, was selected by OBI. Dr. Maryann Feldman, was selected by the Ministry of Colleges and Universities and teaches in the University of North Carolina (UNC) Department of Public Policy and at the UNC Kenan-Flagler Business School. Her research and teaching focus on the geography of innovation, the commercialization of academic research and the factors that promote technological change and economic

growth. Starting next year OBI will implement the recommendations from the mid-term review and begin to prepare for the External Review of the second half of operations including identifying co-chairs and finalizing terms of reference.

OBI will also be working with the renewed Advisory Council that will provide advice and guidance to replace the Scientific Advisory Council and the Industry Advisory Council. OBI will be meeting with the new Advisory Council in the coming fiscal year to seek input on OBI programs and activities.

Milestone	Activity	Metric
Identify co-chairs for External Review of second half of operations	Identify potential co-chairs for the external review of OBI's impact in consultation with MCU	Co-chairs identified
Finalize terms of reference for External Review	Finalize terms of reference for External Review	Terms of Reference finalized

Objective: OBI Advisory Council

Milestone	Activity	Metric
Convene renewed OBI Advisory Council to provide input on OBI programs	Orient Advisory Council chair and new members, items will be brought forward for discussion.	Council 's first meeting

Objective: Fund Raising and Leveraging

OBI plans to raise funds to increase capacity to support research initiatives, increase growth opportunities for small and medium sized companies and expand its programs and services to the broader Ontario neuroscience community. OBI is targeting to raise $10m over a 2-year period beginning April 2021.

OBI has already achieved its leverage target for 2021-22 but will continue focusing on maximizing leverage opportunities. OBI will maximize leverage opportunities through:

1. The Performance Management Framework, the research programs will focus on maximizing grant impact, especially those that are federally funded, to ensure that we are recognizing and accounting for all potential research-driven leveraged funds. An additional $25 to $30M in leveraged funds is anticipated from our research programs.
2. OBI has applied to the Federal Government Strategic Innovation Fund (SIF) to support a national program to develop and grow neurotech companies in Canada. Total funds requested from the SIF program is $28M.
3. OBI's commercialization activities including the Neuroscience Early Research and Development Program and the Entrepreneurship Program are expected to raise up to $3 to 5M in follow-on funding.
4. Knowledge Translation activities are anticipated to raise up to $1M through its GEEK Program, Event Funding Program, and partnerships with neurological charities.
5. Other partnership activities are anticipated to generate $3 to 5M in leveraged funds.

Milestones	**Activity**	**Metric**
Develop fundraising approach	Onboard the fund-raising company selected through RFP process and develop a fund-raising action plan	Onboarding completed
Internal pre-campaign planning and design	Work with the fund-raising company to develop case for support and donor prospects	Fundraising plan in place Case for support completed Donor prospects generated
Gift solicitation kick-off	Engage with close contacts of OBI to identify supporters of the campaign	Solicitation started

ONTARIO BRAIN INSTITUTE | INSTITUT ONTARIEN DU CERVEAU

2021-2022 Operating Budget

Ontario Brain Institute Financial Plan – Operating Plan		**Annual Plan 2020-2021**	**Annual Plan 2021-2022**
Revenue			
Ontario Government		20,000,000	20,000,000
Other Revenue		1,000,000*	
Carry Forward Funding from 2020/21			115,000
Total Funding		**21,000,000**	**20,115,000**
Government Funding			
Expenditures			
Research		9,975,000	9,575,000
Informatics		2,600,000	3,000,000
Industry & Training		1,100,000	1,000,000
KT & Community Outreach		1,250,000	1,440,000
Other Expenditures		1,000,000*	
Salaries & Operating		5,075,000	5,100,000
Total Government-Funded Expenditures		**21,000,000**	**20,115,000**

***Other Revenues have offsetting expenditures as indicated below. These expenditures do not take place unless the revenue is raised in the first place.**

Appendix 1: 2021-2022 Milestones, Activities, and Metrics

Priority: Build a learning healthcare system by integrating research and care, and fueling it with next generation informatics and analytics			
Objective	**Milestone**	**2021-2022 Activity**	**Metric**
Ongoing management of five current IDPs, ensure alignment with OBI Vision and adherence to the OBI model	Develop plan to implement and track standard assessments, beyond Brain-CODE CDEs across all IDPs	Further assess data that has been collected through Brain-CODE clinical CDEs and expand existing dashboards to incorporate more information about nature of data collected through Brain-CODE CDE assessments	# of IDPs with standardized clinical framework # participants with Brain-CODE CDEs
	Identify opportunities and create plan for cross-IDP collaboration i.e. co-morbidity analysis, phase 2 trials	Complete two pilot cross-IDP CDE projects: • Paediatric sleep (POND, CP-NET, EpLink) • Comorbid depression in neurodegenerative disease (CAN-BIND, ONDRI)	# of cross IDP collaboration, # projects/proposals using Zone 1 data
	Conduct annual bibliometric analysis on IDP publications	Assess quality and impact of IDP publications from 2020	# and quality of publications
Active testing of biomarkers in the community care setting	Continue ONDRI@Home	Continue support for data upload and data sharing for ONDRI@Home studies	# of study participants with data in Brain-CODE
	Continue biomarker testing for depression	Continue support for data upload and data sharing for CAN-BIND validation study	# of study participants with data in Brain-CODE

	Initiate a new biomarker trial in other IDPs	Provide informatics support for new studies: • HANDDS-ONT in neurodegenerative and dementia cohorts • Epileptic Encephalophy Registry, to support rare forms of epilepsy • Whole Genome Sequencing in neurodevelopment dementia and cerebral palsy cohorts • Fluid biomarker analysis in dementia cohorts • Quality Improvement initiatives in cerebral palsy, to inform diagnostic guidelines and quality of life	# of clinical trials
Advanced analytics for disease modeling and diagnostics	Ongoing development of new IP, analytic tools, and treatments through participation in Digital Technologies SuperCluster	Continue involvement with Supercluster projects: • Development of a Frailty Care System with XCO and the Home to Healthcare Consortium • Autism Sharing Initiative to develop a patient-centered research platform with DNAStack, POND, Autism Speaks Canada, and Roche	# of projects/proposals using Zone 1 data
	Develop new IP and analytic tools for Brain-CODE through grants, partnerships with industry and AI experts, and IDP development	Continue to work with analytics groups and industrial partners on opportunities to expand analytics capabilities of Brain-CODE	# of projects/proposals using Zone 1 data
Quality improvement processes for healthcare	Establish partnerships between IDPs and frontline care providers	Support the implementation of IDP evidence/research pilots in partnership with care providers	# of partnerships between IDPs and frontline care organizations
	Measure health outcomes of epilepsy and autism ECHO through EpLink and POND	Use Brain-CODE data to identify quality improvement projects from IDPs and support their implementation into the health/care system	# of quality improvement projects
New treatments	Catalyze clinical trials and clinical validation studies through IDPs	Continue to support ongoing clinical trials • CAN-BIND: ECT-Ketamine study for major depressive disorder • CAN-BIND: biomarker validation trial • POND clinical trial network: Rett Syndrome	# of clinical trials

		• ONDRI: deployment of HANNDS-ON, a platform for clinically validating neuro-technologies in the home	
National and International data sharing and linkages	Continued involvement in the Canadian Open Neuroscience Platform as a mechanism to engage with the broader neuroscience community – nationally and internationally	OBI is currently involved with the Canadian Open Neuroscience Platform (CONP) as members of the Technical Steering Committee, Ethics and Governance Committee We will assess future opportunities based on potential for impact.	# of Zone 3 data access requests
	Ongoing data releases from IDPs	Release data from IDPs to external researchers for secondary use	# of Zone 3 data access requests
	Complete Brain-CODE ICES backbone linkage	Complete the backbone linkage between Brain-CODE and ICES and initiate two studies using the linkage Work with IDPs to prioritize projects utilizing the linkage	# of linkage projects
Full implementation of recommendations from OBI Wide External review to ensure a world class informatics platform to support the IDPs	Initiate execution of Brain-CODE strategic plan and build into 2020-2021 SOW with Indoc	Implement the 5 priority areas of the 5-year Strategic Plan for Brain-CODE • Strategy and Planning • Platform Operations • Security, Privacy, & Ethics • Analytics, Data Science, & External Linkages • Partnerships & Business Development	# of Brain-CODE users # of Zone 3 data access requests % growth in Brain-CODE users and capacity
Priority: Growing a Globally Competitive Neurotechnology Cluster			
Objective	**Milestone**	**2021-2022 Activity**	**Metric**
Scale up small companies	Continue with scaled up NERD program	Continue to run NERD to assist neurotech companies with their product development / clinical validation needs Submit a full application to the Stream 5 SIF program to fund a national Canadian Neurotech Support (CNS) Network	NERD follow-on investments # of NERD companies

Attract and develop new management talent and increase employment in the neurotech cluster	Continue ONtrepreneurs program	Run 10th cohort of the ONtrepreneurs program to strengthen the neurotech cluster in Ontario and develop new management capacity for neurosciences Submit a full application to the Stream 5 SIF program to fund a national Canadian Neurotech Support (CNS) Network	ONtrepreneurs follow-on investments # of ONtrepreneurs
	Prioritize Internship support for industry-based clinical validation studies	Place up to 10 interns in roles that will assist with the clinical validation and adoption of neurotechnologies	# of interns per year % follow-on employment # of new co-funders or cluster partners
Procure homegrown products into the healthcare system	Work with innovation partners in new technologies and companies coming through our programs	Complete the first community-based neurotech testing project for epilepsy and initiate a second community-based project Develop a plan for a community-based neurotech testing program	# of products to market # of strategic partnerships with MNEs/funders # of projects with companies
Engage with the broader neurotech cluster	Increase interaction with Ontario companies and IDPs	Work with the IDPs to initiate new clinical validation studies	# of companies/IDP partnerships developed
	Increase integration with company support programs across Ontario	Continue to identify and build relationships with provincial and national partners who will help us scale our neurotech supports across Canada Continue to promote Ontario's Neurotech Cluster, OBI commercialization programs, and companies to investors	# of CROs engaged # of new co-funders or cluster partners
	Categorize and consider expansion of focus of the OBI portfolio companies	Work with researchers/clinicians in OBI's network to evaluate and validate technology, and support the growth and scale of companies	# of portfolio companies

			# of new companies supported over the 5 years
	Increase cluster promotion	Develop and implement a marketing and communication strategy for the cluster	Global recognition of the cluster demonstrated by the engagement of international companies and investors
	Hold a meeting with EEG-based stakeholders to discuss consolidation	Work with IDPs and neurotech companies to assess opportunities for secondary use of EEG data	# of companies engaged with EEG from IDPs Process mapped out
	Investigate the potential for consolidation of similar intellectual property/technologies across research institutions participating in the IDPs	Work with the OBI network to initiate clinical validation studies	 # of clinical validation studies undertaken
Priority: Engaging and empowering the public and patient community to improve brain health			
Objective	**Milestone**	**2021-2022 Activity**	**Metric**
Data-driven decision making/policies	Leverage network of experts for policy discussions on brain health and link to government priorities	Continue building relationships with key government stakeholders and share approaches that can support government priorities	# of policies impacted
	Ongoing work to develop codes for capturing autism and depression in administrative data	Work with IDPs, ICES, and other health system partners to develop algorithms for health system surveillance	# of algorithms developed
Patient research priorities addressed in research	Support patient partnership activities across research process	Continue to facilitate patient partnership by aligning patient interests and IDP needs	# of patient partnership activities # of patients and families engaged in family and science days

	Finalize epilepsy research priority setting partnership	Work with EpLink to host the final Epilepsy Priority Setting Partnership workshop, complete the final report and publicize the findings with the broader research and epilepsy communities for adoption	Final report on priorities
Community-based implementation pilots	Continue GEEK program	Support the two ongoing GEEK cohorts and open a new round of applications to the program. Create more training opportunities for community organizations to build capacity in evaluation	# of partnerships with frontline care # of new partnerships developed
	Scale Indigenous mental health and wellness programs (ongoing, new partnerships)	Support life promotion/suicide prevention for First Nations youth through our partnership with Chiefs of Ontario Continue building relationships with Indigenous partners to support scaling entrepreneurship/innovation for Indigenous communities	# of new partnerships developed
	Work with innovation partners in new technologies and companies coming through our programs	Complete the first community-based neurotech testing project for epilepsy and initiate a second community-based project Develop a plan for a community-based neurotech testing program	# of products to market # of projects with companies
Cost-effective healthcare outcomes and interventions	Develop, disseminate, and evaluate tools to promote brain health	Continue to work with the IDPs to promote the dissemination and implementation of research findings	# of plain language summaries from our research programs
Health system planning using research and administrative data	Update brain disorders in Ontario report using health systems data	Work with ICES to refresh the Brain Disorders in Ontario report outlining prevalence, incidence, and costs of various brain disorders in Ontario	New report released in 2021/2022

Self-management of health	Host four OBI Public Talks to educate and inform public	Host four public talks to inform, educate, and empower people with actionable information	# of people that we engage in our research programs both online and in person
Operations			
Objective	**Milestone**	**2021-2022 Activity**	**Metric**
External Review	Identify co-chairs for External Review of second half of operations	Identify potential co-chairs for the external review of OBI's impact in consultation with Ministry of Colleges and Universities	Co-chairs identified
	Finalize terms of reference for External Review	Finalize terms of reference for external review	Terms of Reference Finalized
OBI Advisory Council	Convene renewed OBI Advisory Council to provide input on OBI programs	Orient Advisory Council chair and new members, items will be brought forward for discussion	Council's s first meeting
Fund Raising	Develop fundraising approach	Onboard the fund-raising company selected through RFP process and develop a fund-raising action plan.	Onboarding completed
	Internal pre-campaign planning and design	Work with the fund-raising company to develop case for support and donor prospects. Engage with close contacts of OBI to identify supporters of the campaign.	Fundraising plan in place Case for support completed Donor prospects generated
	Gift solicitation kick-off	Engage with close contacts of OBI to identify supporters of the campaign	Solicitation started