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Written Submission to the Standing Committee for Science and Research Study on International Moonshot Programs

Brain and Mental Health Research as a National Priority

By: The Canadian Association for Neuroscience

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Brain and Mental Health issues are among the most complex to understand, but also the most important to address –The burden of brain disorders and diseases has substantially increased over the last 25 years with the ageing of the population and is increasing further due to consequences following the COVID19 Pandemic. Half of the world's population will be diagnosed with a brain disorder over the course of their lifetime. This is having a detrimental impact on the economy, healthcare systems, and Canadian livelihood. **Brain disorders, including depression and dementias, are the leading cause of disability, the second leading cause of death worldwide**[1] and are major contributors to the global burden of disease worldwide. Through their research, Canadian neuroscientists work tirelessly to identify cures and therapies for Canadians who live with diseases and conditions.

The Canadian Association for Neuroscience is the largest association of neuroscientists in Canada, with over 1000 members dedicated to advancing brain research. We urge the government of Canada to make **research on the Brain and Mental Health a national priority** by investing in research to understand the brain.

In addition to benefits for the health of all Canadians and reducing the global burden of disease, a **Brain Moon Shot program** would contribute to:

· **Creating Good Jobs for Canadians** – Investing in scientific research leads to the creation of jobs for highly qualified personnel (HQP) not just within research laboratories but across industry, government, and the public sector. Our trainees play key roles in medical and high-tech companies in Canada, who are looking to fill competitive job opportunities.

· **Maintaining Canada's Competitiveness and Leadership in the World** – Canada's scientists have historically been known to produce above expectations and are recognized leaders in many fields of brain research including **autism, memory, sleep, pain, artificial intelligence, and spinal cord injury**. However, it is difficult

[1] Feigin et al. Lancet Neurol. 2019;18(5):459-480. doi:10.1016/S1474-4422(18)30499-X)

for Canadian scientists to remain competitive and for Canada to attract new talent as the disparity in research support with other G7 countries continues to widen.

· **Diversifying and Strengthening Canada's Economy** – The world is moving towards a knowledge and innovation economy, in which Canada has the potential to lead. *Made-in-Canada* discoveries are the foundation for innovation that supports a stronger and more diverse Canadian economy.

Canada must invest in research to understand the brain to secure its position as a scientific leader in the world, and to support a knowledge-based economy that is prepared to face future challenges.

Brain diseases and disorders are amongst the most important challenges facing Canadians today because for the **vast majority of brain disorders and diseases, few effective therapies exist, and no cures.** Research to understand the brain offers much needed hope. Canadian neuroscientists are making discoveries that have potential to change lives.

Funding brain research can lead to life saving therapies

While most people recognize how fundamental research was key to the development of the COVID-19 vaccines, it is important to keep in mind that research performed in Canada has the potential to improve and save lives of individuals from many diseases. One very recent example, reported on CTV News, showed how Canadian doctors performed the world-first delivery of treatment for an inoperable brain tumour in a child using ultrasound[2]. This incredible feat was possible by ground-breaking research done at the Sunnybrook Research Centre and the Sick Kids Hospital in Toronto using a novel focused ultrasound technology to deliver drugs across the blood-brain barrier. Moreover, this innovative approach allows for drugs

[2] https://www.ctvnews.ca/health/canadian-doctors-perform-world-first-delivery-of-treatment-for-inoperable-brain-tumour-in-kid-using-ultrasound-1.6225776

to specifically reach affected areas of the brain, offering hope for patients with inoperable, and often terminal, brain tumours.

Now is the time to invest in a Canadian Brain Research Initiative

Canadian neuroscientists are world leaders in many fields of brain and mental health research. The development of a **national brain research strategy** would support collaborative, multidisciplinary and large-scale research programs that have the potential to lead to breakthroughs in our understanding and treatment of brain disease, like the example above. The need for specific brain moonshot programs has been recognized by the European Union, the USA, Japan, China, Korea, Australia, Finland, New Zealand, Latin America and Africa, which have all launched or are developing brain-themed national or international programs. The **Canadian Brain Research Strategy** has started to lay the groundwork for a Canadian Brain Initiative by bringing together researchers, patient partners and other key stakeholders to develop a model of open, collaborative, transdisciplinary and ethical brain research that reflects Canada's strengths.Canada has the potential to contribute and connect to international efforts, with the support of the Canadian government. Moonshot programs work for challenging diseases and one need only to look at HIV/AIDS as an example. Over 18B has been devoted to AIDS research over the years in the USA[3],, and this has led to advancements in therapeutics such that HIV infections are no longer a death sentence as individuals with HIV can live relatively full lives[4]. Knowing that brain disorders will inflict 50% of the population, are the leading cause of disability, and contribute to the global burden of disease - it's hard not to get excited over the possibilities for healthier lives and economy if we invest in brain research.

Funding brain research is an investment in our health, our economy, and a better future for all Canadians.

[3] https://www.kff.org/hivaids/fact-sheet/u-s-federal-funding-for-hivaids-trends-over-time/
[4] Samji, H. et al. Closing the gap: increases in life expectancy among treated HIV-positive individuals in the United States and Canada. PloS One 8, e81355 (2013).