

Australian Brain Initiative

Creating an innovative and healthy nation by *Cracking the Brain's Code*

Australian Brain Initiative

After decades of progress in brain sciences and technology, we are on the cusp of a new era of science; one that will transform our understanding of behaviour and learning, illness and disease and lead to revolutionary high-tech industries based on neurotechnology.

Australia has the opportunity to be at the forefront of this revolution by investing in a 5-year \$500 million science and innovation initiative that will:

- Establish an advanced neurotechnology industry sector. The potential for Australia in this emerging global industry sector is huge. By connecting brain scientists with innovators and investors, Australia has the opportunity to seed the Cochlears of the future and ensure the next generation of neuroentrepreneurs build their high-tech global companies in Australia.
- Develop treatments for debilitating brain disorders. One-third of the burden of disease in Australia is caused by brain and mental health disorders, costing the Australian economy at least \$45.5 billion a year¹. Cracking the brain's code is the step-change needed to understand normal brain function and develop new approaches to treat the causes of brain and mental health disorders, such as stroke, traumatic brain injury, intellectual and learning disabilities, Alzheimer's disease and severe anxiety and depression.
- Harness the plasticity of the brain to improve teaching and learning outcomes. In the longer term, brain science and technology will transform the way we teach and learn, to improve productivity in the workforce and throughout the lifespan.

New multi-billion dollar brain science initiatives are underway in the US, Japan, Europe and China. With our rich and proud history in brain science, Australia has the opportunity to be a major player in this international effort. By retaining our best scientists, attracting international science superstars, and linking researchers with new global high-tech industries, we can ensure that Australians enjoy the social, health and economic benefits that will flow from a better understanding of the brain.

The promise of neurotechnology

Neurotechnology includes brain-machine interfaces such as the bionic eye and the bionic ear, guided by our ever-increasing understanding of brain function.

To illustrate, in a landmark study published this year, electrodes were inserted deep into the brain of a quadriplegic to record and transmit motor impulses directly to his arm, bypassing the damaged spinal cord.

For the first time, totally paralysed adults and children have the prospect of being able to control their own arm to pour a drink or swipe a credit card.



¹ Australian Institute of Health and Welfare (AIHW) "The burden of disease and injury in Australia"; cost estimates sourced from AIHW, National Stroke Foundation, Australian Institute of Criminology, Medibank Private & Nous Group.

A National Brain Initiative for Australia

A five-year \$500 million **Australian Brain Initiative** will bring together leading Australian and international researchers and innovators to **crack the brain's code**.

- **Priority-driven research funding** to support targeted research aligned with Australia's science and research priorities. This funding will bring Australian and international experts from diverse disciplines together to drive real progress and breakthroughs in our understanding of the brain and behaviour and will build capacity by providing world-class training to the next generation of brain scientists and neuroentrepreneurs.
- Industry linkage and innovation: funding to seed innovative start-ups and generate transformative collaboration between brain researchers and high-tech industries. Government investment in this rapidly expanding sector would attract significant co-investment from industry.
- **Genius Awards** to retain our top brain scientists and bring world-leading researchers to Australia to spearhead this flagship science initiative.
- International engagement: capacity to secure Australia's seat at the table on the major international brain initiatives currently underway through bilateral and multilateral science and innovation partnerships for Australian researchers and industry.



Cracking the brain's code

The challenge of understanding the brain exceeds that of landing on the moon and sequencing the human genome. The science focus of the Australian Brain Initiative will be **cracking the brain's code** to understand the core processes in the brain that allow it to function.

Understanding the brain's code will lead to revolutionary technologies that will change the way we interact with the world, treat disease and educate our grandchildren.

- Public outreach and policy: a program of public engagement events, school education activities, and briefings and advice on relevant public policy issues from the world's leading brain scientists.
- Management and coordination: to determine the strategic research priorities, enable coordination with the Biomedical Translation Fund and the Medical Research Future Fund, ensure coordination of Australian research effort and oversee international linkages.

An Australian investment of \$500 million over five years is commensurate with Europe's €1 billion Human Brain Project; China's new \$1 billion 'China Brain'; Japan's \$300 million Brain/MINDS project and the 10-year US BRAIN Initiative that was launched in 2013 with an anticipated annual budget of \$500 million by 2020.

In addition to linking Australia to these world-leading research and innovation programs, the **Australian Brain Initiative** would complement funding available through existing commercialisation and research funding programs. The allocation of funding to the different elements of the Initiative would be determined once the budget is known.

What will be achieved?

The Australian Brain Initiative will generate new industries and treatments for disease, cementing Australia as one of the world's leading centres for brain science. With likely contributions from philanthropic and international science funding agencies in the tens and hundreds of millions of dollars, by 2020 Australia can expect world-leading start-up companies positioned to become Australia's major and multinational economic drivers, and the very real prospect of Nobel Prizes in neuroscience for Australia.



Australian Brain Alliance

The Australian Brain Alliance is a group of Australia's leading brain science organisations and researchers with an interest in advancing our understanding of the brain.



www.ausbrain.org.au