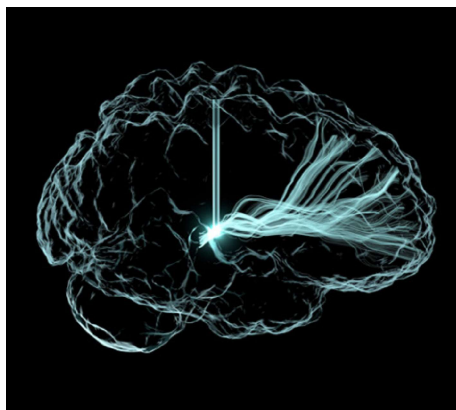




Why do we need the NIH BRAIN Initiative?

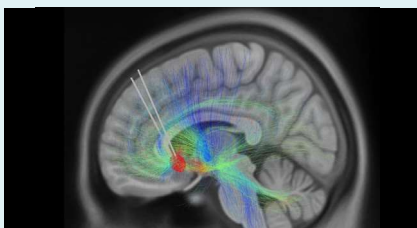
The human brain is the most powerful, flexible, and energy-efficient computer known to humankind. Understanding its mysteries and what goes wrong in disease or injury is one of the greatest challenges of our lifetime. The National Institutes of Health (NIH) *Brain Research Through Advancing Innovative Neurotechnologies*® Initiative, or The BRAIN Initiative®, has met this challenge head-on since 2013. An exciting and productive decade of innovation has changed neuroscience in ways we couldn't have imagined 10 years ago. A new culture of open, team science has built an expansive catalog of brain cells and circuits, informing how the brain works in precise detail. On the horizon are safe and effective new therapies that can precisely target brain cells and brain circuits to treat chronic brain conditions.

One in three Americans is living with a brain disorder

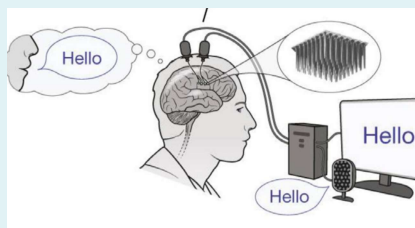
Brain conditions cost the U.S. **\$1.5 trillion** annually

Human-Centered Neurotechnologies Offer Promise for Life-Changing Treatments

First-in-human neurotechnologies have shown remarkable success in small clinical studies funded by the BRAIN Initiative



Innovations in deep brain stimulation are treating depression, obsessive-compulsive disorder, PTSD, chronic pain, and addiction.

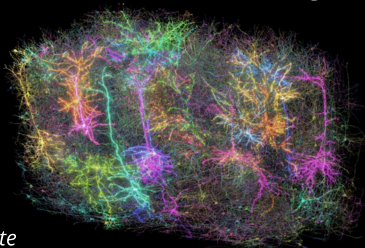


Brain-computer interfaces convert brain waves into speech, helping people paralyzed by amyotrophic lateral sclerosis (ALS) and other conditions improve their quality of life.



Spinal cord stimulation restores arm and hand mobility after injury or stroke, helping people live independently again.

Machine Intelligence from Cortical Networks (MICrONS) Program



Allen Institute

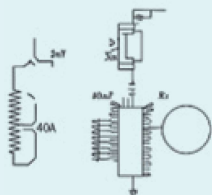
An expansive NIH BRAIN Initiative-funded team science effort produced a fully integrated, highly detailed and dynamic map of a tiny piece of mouse brain: 2.5 miles of axons and 523 million connections between 200,000 brain cells. This transformative work will advance both brain science and computational science.

New Open-Source Tools Create Ways to Map the Brain in Unprecedented Detail

- The first complete comprehensive atlas of cells that make up the whole mouse brain and a draft atlas of the human brain together will provide a “parts list” or blueprint for the most complex organ in the body.
- Research from the National Institute on Drug Abuse accelerated by the BRAIN Initiative identified a key brain switch that drives opioid addiction.
- Research from the National Institute on Aging that used NIH BRAIN Initiative-supported mapping tools revealed unexpected new potential treatment targets for early-stage Alzheimer's disease.
- New gene delivery systems can precisely target different cell types in the human brain and spinal cord. This marks a major advance toward developing safe, accurate gene therapy for human brain disorders.

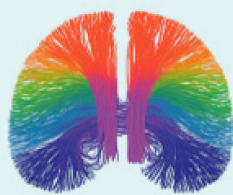
A Technology-Driven Revolution is Underway

Four large-scale NIH BRAIN Initiative projects are designed to help scientists better understand how the human brain is built and how it works. The projects aim to identify all the different types of brain cells, figure out how those cells are connected, create tools to target specific cells, and track how brain activity relates to real-life behavior. By combining all this information, we will have a clearer picture of how the brain functions and how to translate that knowledge into precise treatments for many different types of brain disorders.



PARTS LIST

The BRAIN Initiative
Cell Atlas Network



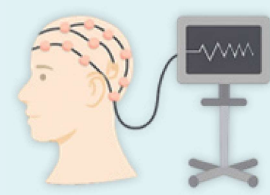
WIRING DIAGRAM

The BRAIN Initiative
Connectivity Across
Scales Network



REPAIR TOOLS

Armamentarium for
Precision Brain
Cell Access

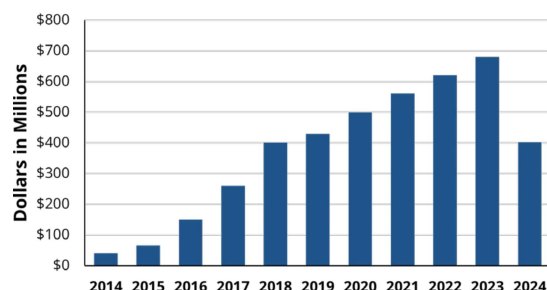


REAL-TIME READOUT

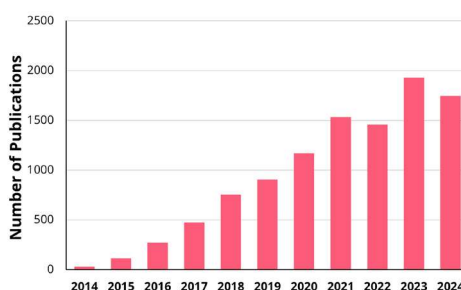
Brain Behavior
Quantification and
Synchronization Program

NIH BRAIN Initiative by the Numbers

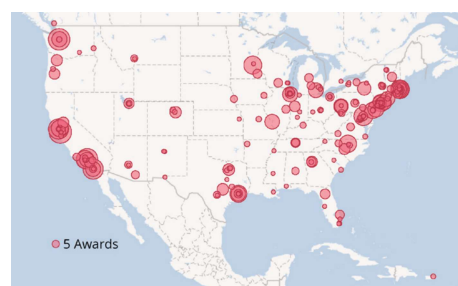
Budget: Fiscal Years 2014-2024



Publications: 2014-2024



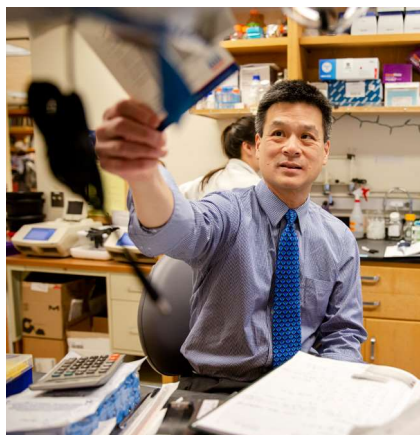
Awarded Institutions: 2014 - 2024



1,791 PIs across **266 Institutions** supported by **over 1,600 NIH BRAIN Initiative Awards**

Integrating neuroscience across 10 participating NIH Institutes and Centers:

- NINDS
- NIDCD
- NIDA
- NIA
- NCCIH
- NIMH
- NICHD
- NIBIB
- NEI
- NIAAA



John Ngai, Ph.D.

Director, NIH Brain Initiative

Read About Our Decade of Innovation



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