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Office of the Press Secretary

For Immediate Release

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Fact Sheet: BRAIN Initiative

"If we want to make the best products, we also have to invest in the best ideas... Every dollar we invested to map the human genome returned \$140 to our economy... Today, our scientists are mapping the human brain to unlock the answers to Alzheimer's... Now is not the time to gut these job-creating investments in science and innovation. Now is the time to reach a level of research and development not seen since the height of the Space Race."

- President Barack Obama, 2013 State of the Union

In his State of the Union address, the President laid out his vision for creating jobs and building a growing, thriving middle class by making a historic investment in research and development.

Today, at a White House event, the President unveiled a bold new research initiative designed to revolutionize our understanding of the human brain. Launched with approximately \$100 million in the President's Fiscal Year 2014 Budget, the BRAIN (Brain Research through Advancing Innovative Neurotechnologies) Initiative ultimately aims to help researchers find new ways to treat, cure, and even prevent brain disorders, such as Alzheimer's disease, epilepsy, and traumatic brain injury.

The BRAIN Initiative will accelerate the development and application of new technologies that will enable researchers to produce dynamic pictures of the brain that show how individual brain cells and complex neural circuits interact at the speed of thought. These technologies will open new doors to explore how the brain records, processes, uses, stores, and retrieves vast quantities of information, and shed light on the complex links between brain function and behavior.

This initiative is one of the Administration's "Grand Challenges" – ambitious but achievable goals that require advances in science and technology. In his remarks today, the President called on companies, research universities, foundations, and philanthropists to join with him in identifying and pursuing the Grand Challenges of the 21st century.

The BRAIN Initiative includes:

- **Key investments to jumpstart the effort:** The National Institutes of Health, the Defense Advanced Research Projects Agency, and the National Science Foundation will support approximately \$100 million in research beginning in FY 2014.
- **Strong academic leadership:** The National Institutes of Health will establish a high-level working group co-chaired by Dr. Cornelia "Cori" Bargmann (The Rockefeller University) and Dr. William Newsome (Stanford University) to define detailed scientific goals for the NIH's investment, and to develop a multi-year scientific plan for achieving these goals, including timetables, milestones, and cost estimates.
- **Public-private partnerships:** Federal research agencies will partner with companies, foundations, and private research institutions that are also investing in relevant neuroscience research, such as the Allen Institute, the Howard Hughes Medical Institute, the Kavli Foundation, and the Salk Institute for Biological Studies.
- **Maintaining our highest ethical standards:** Pioneering research often has the potential to raise new ethical challenges. To ensure this new effort proceeds in ways that continue to adhere to our highest standards of research protections, the President will direct his Commission for the Study of Bioethical Issues to explore the ethical, legal, and societal implications raised by this research initiative and other recent advances in neuroscience.

Background

In the last decade alone, scientists have made a number of landmark discoveries that now create the opportunity to unlock the mysteries of the brain, including the sequencing of the human genome, the development of new tools for mapping neuronal connections, the increasing resolution of imaging technologies, and the explosion of nanoscience. These breakthroughs have paved the way for unprecedented collaboration and discovery across scientific fields. For instance, by combining advanced genetic and optical techniques, scientists can now use pulses of light to determine how specific cell activities in the brain affect behavior. In addition, through the integration of neuroscience and physics, researchers can now use high-resolution imaging technologies to observe how the brain is structurally and functionally connected in living humans.

While these technological innovations have contributed substantially to our expanding knowledge of the brain, significant breakthroughs in how we treat neurological and psychiatric disease will require a new generation of tools to enable researchers to record signals from brain cells in much greater numbers and at even faster speeds. This cannot currently be achieved, but great promise for developing such technologies lies at the intersections of nanoscience, imaging, engineering, informatics, and other rapidly emerging fields of science and engineering.

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President Obama unveils the "BRAIN" Initiative—a bold new research effort to revolutionize our understanding of the human mind and uncover new ways to treat, prevent, and cure brain disorders like Alzheimer's, schizophrenia, autism, epilepsy, and traumatic brain injury.

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Key Investments to Launch this Effort

To make the most of these opportunities, the National Institutes of Health, the Defense Advanced Research Projects Agency, and the National Science Foundation are launching this effort with funding in the President's FY 2014 budget.

- **National Institutes of Health:** The NIH Blueprint for Neuroscience Research—an initiative that pools resources and expertise from across 15 NIH Institutes and Centers—will be a leading NIH contributor to the implementation of this initiative in FY 2014. The Blueprint program will contribute funding for the initiative, given that the Blueprint funds are specifically devoted to projects that support the development of new tools, training opportunities, and other resources. In total, NIH intends to allocate approximately \$40 million in FY 2014.
- **Defense Advanced Research Projects Agency:** In FY 2014, DARPA plans to invest \$50 million in a set of programs with the goal of understanding the dynamic functions of the brain and demonstrating breakthrough applications based on these insights. DARPA aims to develop a new set of tools to capture and process dynamic neural and synaptic activities. DARPA is interested in applications—such as a new generation of information processing systems and restoration mechanisms—that dramatically improve the way we diagnose and treat warfighters suffering from post-traumatic stress, brain injury, and memory loss. DARPA will engage a broad range of experts to explore the ethical, legal, and societal issues raised by advances in neurotechnology.
- **National Science Foundation:** The National Science Foundation will play an important role in the BRAIN Initiative because of its ability to support research that spans biology, the physical sciences, engineering, computer science, and the social and behavioral sciences. The National Science Foundation intends to support approximately \$20 million in FY 2014 in research that will advance this initiative, such as the development of molecular-scale probes that can sense and record the activity of neural networks; advances in “Big Data” that are necessary to analyze the huge amounts of information that will be generated, and increased understanding of how thoughts, emotions, actions, and memories are represented in the brain.

Private Sector Partners

Key private sector partners have made important commitments to support the BRAIN Initiative, including:

- **The Allen Institute for Brain Science:** The Allen Institute, a nonprofit medical research organization, is a leader in large-scale brain research and public sharing of data and tools. In March 2012, the Allen Institute for Brain Science embarked upon a ten-year project to understand the neural code: how brain activity leads to perception, decision making, and ultimately action. The Allen Institute's expansion, with a \$300M investment from philanthropist Paul G. Allen in the first four years, was based on the recent unprecedented advances in technologies for recording the brain's activity and mapping its interconnections. More than \$60M annually will be spent to support Allen Institute projects related to the BRAIN Initiative.
- **Howard Hughes Medical Institute:** HHMI is the Nation's largest nongovernmental funder of basic biomedical research and has a long history of supporting basic neuroscience research. HHMI's Janelia Farm Research Campus in Virginia was opened in 2006 with the goal of developing new imaging technologies and understanding how information is stored and processed in neural networks. It will spend at least \$30 million annually to support projects related to this initiative.
- **Kavli Foundation:** The Kavli Foundation anticipates supporting activities that are related to this project with approximately \$4 million dollars per year over the next ten years. This figure includes a portion of the expected annual income from the endowments of existing Kavli Institutes and endowment gifts to establish new Kavli Institutes over the coming decade. This figure also includes the Foundation's continuing commitment to supporting project meetings and selected other activities.
- **Salk Institute for Biological Studies:** The Salk Institute, under its Dynamic Brain Initiative, will dedicate over \$28 million to work across traditional boundaries of neuroscience, producing a sophisticated understanding of the brain, from individual genes to neuronal circuits to behavior. To truly understand how the brain operates in both healthy and diseased states, scientists will map out the brain's neural networks and unravel how they interrelate. To stave off or reverse diseases such as Alzheimer's and Parkinson's, scientists will explore the changes that occur in the brain as we age, laying the groundwork for prevention and treatment of age-related neurological diseases.

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