NIH Focuses on the Brain

At a time when many programs are being trimmed or eliminated, the National Institutes of Health (NIH) is launching a series of efforts focused on the brain, including special emphasis on increasing understanding, diagnosis, and treatment of neurodegenerative processes. Two of these efforts were highlighted by NIH in September with the announcement of new foci for funding and of targeted awards for Alzheimer disease. Many of the target foci and awards announced include functional and molecular imaging as integral parts of planned investigations.

Advancing the BRAIN Initiative

On September 16 NIH Director Francis S. Collins, MD, PhD, detailed the approval of initial areas of high-priority brain research to guide $40 million of NIH fiscal year 2014 funding as part of the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative. The initiative aims to accelerate work on technologies that give a dynamic picture of the ways in which individual cells and complex neural circuits interact. The ultimate goal is to enhance understanding of the brain and improve prevention, diagnosis, and treatment of brain diseases. The initiative was announced earlier in the year by President Obama, who called for a total of $110 million in the 2014 fiscal year budget to support the effort.

"The time is right to exploit recent advances in neuroscience research and technologies to advance our understanding of the brain's functions and processes and what causes them to go wrong in disease," said Collins. "The BRAIN Working Group has been on a fast track to identify key areas of research for funding. This group of visionary neuroscientists has provided an excellent set of recommendations, and I am eager to move these areas forward." The NIH 2014 investment will focus on 9 areas of research, which it is hoped can be combined to yield integrative insights into the science of cells, circuits, brain, and behavior. These areas of research are intended to: (1) generate a census of brain cell types; (2) create structural maps of the brain; (3) develop new, large-scale neural network recording capabilities; (4) develop a suite of tools for neural circuit manipulation; (5) link neuronal activity to behavior; (6) integrate theory, modeling, statistics, and computation with neuroscience experiments; (7) delineate mechanisms underlying human brain imaging technologies; (8) create mechanisms to enable collection of human data for scientific research; and (9) disseminate knowledge and training.

The BRAIN Initiative is jointly led by NIH, the Defense Advanced Research Projects Agency of the U.S. Department of Defense, and the National Science Foundation. Private partners—including the Allen Institute for Brain Science, Howard Hughes Medical Institute, and Kavli Foundation—are also participants. Additional information is available at: www.nih.gov/science/brain/index.htm.

New Funding for Alzheimer Disease Research

NIH announced on September 18 the award of approximately $45 million in new funding to researchers who will test promising drugs aimed at preventing Alzheimer disease (AD) and also identify and validate biologic targets for novel therapies. The studies are among the first to be developed with direction from the 2012 NIH Alzheimer's Disease Research Summit: Path to Treatment and Prevention and reflect research goals in the National Plan to Address AD. The awarded projects include clinical trials to investigate ways to slow the progression of AD, as well as translational studies focused on identifying, characterizing, and validating novel therapeutic targets.

"We know that Alzheimer's-related brain changes take place years, even decades, before symptoms appear. That really may be the optimal window for drugs that delay progression or prevent the disease altogether," said National Institute on Aging Director Richard J. Hodes, MD. "The clinical trials getting under way with these funds will test treatments in symptom-free volunteers at risk for the disease, or those in the very earliest stages—where we hope we can make the biggest difference." Among the awards announced were:

The Dominantly Inherited Alzheimer Network Trials Unit Trial; Washington University (St. Louis, MO).

The trial will test new anti-amyloid-β drug treatments in volunteers who have an inherited form of AD characterized by early onset. The 4-year, multisite international trial will test 3 anti-amyloid-β interventions: gantenerumab, solanezumab, and a third, as yet undetermined, drug.

The Alzheimer's Prevention Initiative APOE4 Trial; Banner Alzheimer's Institute (Phoenix, AZ). This 5-year prevention trial will test an anti-amyloid drug in cognitively normal older volunteers who are at increased risk of developing late-onset AD because they have inherited 2 copies of the APOE4 allele. The study will assess the role of amyloid in development of AD and, through imaging and biomarker techniques, help identify faster ways to evaluate other promising prevention therapies.

Allopregnanolone Regenerative Therapeutic for Mild Cognitive Impairment (MCI)/AD: Dose Finding Phase 1; University of Southern California, Los Angeles. This early-phase clinical trial will evaluate the safety and tolerability of increasing doses of allopregnanolone, a natural brain steroid, in treating MCI and AD. The drug has been shown to promote generation of new brain cells, reduce amyloid levels, and restore cognitive function in preclinical animal testing.

Pathway Discovery, Validation and Compound Identification for AD; the Brigham and Women's Hospital, Broad Institute, and Harvard University (Boston, MA); and Rush University Medical Center (Chicago, IL). The 5-year study will discover, characterize, and validate complex molecular networks and candidate genes that influence susceptibility

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