

NIH Blueprint for Neuroscience Research

The NIH Office of the Director and these NIH Institutes and Centers participate in the NIH Blueprint for Neuroscience Research:

- NCCAM
- NCRR
- NEI
- NIA
- NIAAA
- NIBIB
- NICHD
- NIDA
- NIDCD
- NIDCR
- NIEHS
- NIGMS
- NIMH
- NINDS
- NINR
- OBSSR

The Blueprint Mission

Over the past century, researchers have made breathtaking progress in understanding the anatomy, cell biology, physiology and chemistry of the brain. Yet many fundamental mysteries remain, including how brain function translates into mental function and why brain function declines with age. Recent advances in neuroimaging, genomics, computational neuroscience, engineering and other disciplines have put us on the brink of another great era in neuroscience, when we can expect to make transformative discoveries regarding brain function in health, aging and disease.

The NIH Blueprint for Neuroscience Research aims to accelerate these discoveries. The Blueprint is a collaborative framework that includes the NIH Office of the Director and the NIH Institutes and Centers that support research on the nervous system. By pooling resources and expertise, the Blueprint identifies cross-cutting areas of research and confronts challenges too large for any single Institute or Center. Since its inception in 2004, the Blueprint has supported the development of new tools, training opportunities and other resources to assist neuroscientists. In 2009, the Blueprint Grand Challenges were launched to catalyze research with the potential to transform our basic understanding of the brain and our approaches to treating brain disorders.

Blueprint Grand Challenges

- The **Human Connectome Project** is an effort to map the connections within the healthy brain. It is expected to help answer questions about how genes influence brain connectivity, and how this in turn relates to mood, personality and behavior. The investigators will collect brain imaging data, plus genetic and behavioral data from 1,200 adults. They are working to optimize brain imaging techniques to see the brain's wiring in unprecedented detail.
- The **Grand Challenge on Pain** supports research to understand the changes in the nervous system that cause acute, temporary pain to become chronic. The initiative is supporting multi-investigator projects to partner researchers in the pain field with researchers in the neuroplasticity field.
- The **Blueprint Neurotherapeutics Network** is helping small labs develop new drugs for nervous system disorders. The Network provides research funding, plus access to millions of dollars worth of services and expertise to assist in every step of the drug development process, from laboratory studies to preparation for clinical trials. Project teams across the U.S. have received funding to pursue drugs for conditions from vision loss to neurodegenerative disease to depression.

Blueprint Resources

Neuroimaging Informatics Tools and Resources Clearinghouse (NITRC) is a web-based clearinghouse that helps researchers find, compare and rate neuroimaging informatics tools and resources.

Neuroscience Information Framework (NIF) is an online portal to neuroscience information that includes a customized search engine, a curated registry of resources and direct access to more than 100 databases.

Blueprint Resources Antibodies Initiative for Neurodevelopment (BRAINdev) is funding the targeted manufacture and distribution of high quality monoclonal antibodies for neurodevelopment research, which are available from www.neuromab.org. A list of antibody targets in progress can be found under Current Projects.



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NIH Blueprint for Neuroscience Research *(continued)*

NIH Toolbox for Assessment of Neurological and Behavioral Function is a set of integrated tools for measuring neurological and behavioral function, and for generating data that can be used and compared across diverse clinical studies.

Cre Driver Network is a project to develop, characterize and distribute Cre recombinase mouse lines, which can be used to control expression of conditional-ready alleles in regionally and/or temporally restricted patterns in the mouse nervous system.

Gene Expression Nervous System Atlas (GENSAT) is a project to develop, characterize and distribute mice expressing green fluorescent protein (GFP) receptors or Cre recombinases in specific neural and glial cell populations.

Blueprint Non-Human Primate Brain Atlas provides comprehensive data on gene expression in the rhesus macaque brain at four stages, from birth to four years old. It is expected to aid research on human brain development and developmental disorders.

Blueprint Training Programs help undergraduate and graduate students pursue careers in neuroscience. Current programs focus on computational neuroscience, brain imaging and support for individuals who are typically underrepresented in the field.

Blueprint Science Education Awards support the development of new approaches to teaching neuroscience—including K-12 instruction, museum exhibits and web-based platforms.

The Future of the Blueprint

The Blueprint welcomes suggestions from the scientific, clinical and patient communities regarding initiatives that will advance the progress of neuroscience research. Contact us by email at blueprint@mail.nih.gov. Workshop summaries, requests for information, new developments and specific initiatives are posted at www.neuroscienceblueprint.nih.gov. For a quick guide to Blueprint accomplishments, see www.neuroscienceblueprint.nih.gov/accomplishments.htm.



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