

Brain Research through Advancing Innovative Neurotechnologies® (BRAIN)

Multi-Council Working Group (MCWG) Meeting

May 16th, 2019

The NIH BRAIN Initiative [Multi-Council Working Group](#) (MCWG) met on May 16 to discuss the upcoming report to the NIH Director's Advisory Committee (ACD), consider concept clearances for future funding opportunities, and provide feedback on current funding plans.

In opening remarks, Walter Koroshetz, M.D., NINDS Director, mentioned that the recent [BRAIN Initiative Investigators Meeting](#), which was held from April 11-13, had 1600 attendees, which was a 33 percent increase over the 2018 meeting. The conference included scientific presentations, poster sessions, and a three-part communications workshop, during which attendees received tips for speaking to the public, the media, and using social media to describe their science. NIH Director Francis Collins, M.D., Ph.D., moderated an [ACD Working Group 2.0 Town Hall](#) event during the meeting. Dr. Koroshetz also showed the winners of the inaugural "[Show Us Your BRAINS! Cool Picture and Video Contest](#)."

Recent BRAIN-related updates included news that the Institute of Electrical and Electronics Engineers ([IEEE](#)) [Brain Initiative joined the BRAIN Initiative Alliance](#), and BRAIN Team Leadership changes at NIH.

Dr. Koroshetz also described a BRAIN Initiative funded study that was recently published in Nature Biomedical Engineering. In this study, a group led by Daniel Razansky, Ph.D., [created an optoacoustic map of the mouse brain](#), based on calcium signaling, that allows for rapid recording of deeper structures compared to light imaging.

John Maunsell, Ph.D., provided an update on the [ACD BRAIN Initiative Working Group \(WG\) 2.0](#) report, which will be presented to the [Advisory Committee of the NIH Director on June 14](#). The WG was charged with reviewing progress to date, identifying new opportunities, and considering ways to improve diversity and training. The group's initial impression of the review is that the BRAIN Initiative has been meeting or exceeding expectations. The Initiative has successfully brought together a wide range of scientists, outside of neuroscience, to study the brain and the program has stayed close to the [BRAIN 2025 Report](#) that was written by the original BRAIN ACD WG and issued in 2014. The flagship success of the BRAIN Initiative to date has been the Cell Census Network ([BICCN](#)), which aims to characterize all of the different cells in the brain and identify what they do. The group also said that it will be important to continue, and not slow down, the momentum of technology development. Examples of areas that are recommended for increased effort include: research on artificial technology and theory, distributing the new technologies that have been developed, and informing the public on scientific advancements. The WG noted that the most challenging aspect of the BRAIN Initiative is around bridging scales, such as moving from synapse to cells and circuits. The WG also identified potential large-scale, transformative projects including pinpointing specific circuits implicated in diseases and modifying them, mapping the entire mouse brain and determining circuits controlling specific behaviors, and learning how the brain retrieves information.

The WG is also recommending that an additional priority area, Organization of Science, be part of the BRAIN Initiative going forward. This is a broad category that will include topics such as team science, data sharing, and increasing diversity. The discussion following Dr. Maunsell's presentation focused on data management, including how to encourage data sharing and options for data repositories.

Jim Eberwine, Ph.D., provided an update from the ACD BRAIN Initiative Working Group 2.0 [Neuroethics Subgroup \(BNS\)](#), which will also present a report to the ACD on June 14. The BNS was charged with developing a Neuroethics Roadmap for the BRAIN Initiative and considering the neuroethical implications that arise from BRAIN Initiative funded research. The BNS determined that there is an ethical mandate in the BRAIN Initiative to improve human health by understanding how the brain works. The report contains examples of neuroethics-related issues unique to the BRAIN Initiative including unexpected information that may result from data sharing and companies needing to be aware of potential neuroethical consequences of their products. The BNS also proposed a transformative project for the second phase of the BRAIN Initiative focused on understanding the basis of consciousness. This would entail a large-scale, concerted, interdisciplinary neuroscience/neuroethics-focused project that would result in neuroscience revolutionizing long-held philosophical notions of features such as sentience and the mind.

Three concept clearances for future funding opportunities were presented to the MCWG. The first one was about alternatives to models of the developing human nervous system. This will focus on creating three-dimensional systems that contain human cells, to improve our understanding of human brain development, which is currently restricted due to technical limitations and the relative inaccessibility of the developing human brain. Several proof-of-concept studies have been published, but there remains a need for more reliable models. Examples of potential approaches include using novel materials to stimulate neural tissue organization in *in vitro* model systems and development of functional human cell-based assays to measure plasticity.

Two concept clearances were presented related to marmoset research. The first concept focused on the development of genetic tools and technologies to improve our understanding of primate brains. Additional goals of the concept will be to disseminate the technologies and encourage data sharing. The second concept focused on developing colonies and coordinating distribution of marmosets for research. There are currently a small number of marmosets available but demand by neuroscience researchers is increasing. It was also noted that it will be important to enhance genetic diversity of the laboratory population of marmosets, and to provide support for transport to labs and appropriate care for the unique needs of these animals.

The meeting proceeded with a closed session of the MCWG members and federal staff to discuss proposed funding plans for the second round of FY19 Requests for Applications.