

Embargoed for Release

December 16, 2013
9:00 am EST

CONTACT:

Barbara McMakin and Marian Emr
nindspressteam@ninds.nih.gov
(301) 496-5751

NIH and NFL tackle concussion research

NIH announces research projects funded largely by donation from the NFL

The National Institutes of Health has selected eight projects to receive support to answer some of the most fundamental problems on traumatic brain injury, including understanding long-term effects of repeated head injuries and improving diagnosis of concussions.

Funding is provided by the Sports and Health Research Program, a partnership among the NIH, the National Football League, and the Foundation for the National Institutes of Health (FNIH). In 2012, the NFL donated \$30 million to FNIH for research studies on injuries affecting athletes, with brain trauma being the primary area of focus.

Traumatic brain injury (TBI) is a major public health problem that affects all age groups and is the leading cause of death in young adults. Recently, concern has been raised about the potential long-term effects of repeated concussion, particularly in those most at risk: young athletes and those engaged in professions associated with frequent head injury, including men and women in the military. Current tests cannot reliably identify concussions, and there is no way to predict who will recover quickly, who will suffer long-term symptoms, and which few individuals will develop progressive brain degeneration, called chronic traumatic encephalopathy (CTE).

“We need to be able to predict which patterns of injury are rapidly reversible and which are not. This program will help researchers get closer to answering some of the important questions about concussion for our youth who play sports and their parents,” said Story Landis, Ph.D., director of the National Institute of Neurological Disorders and Stroke (NINDS), part of NIH.

Two (\$6 million each) are large, cooperative agreements focused on defining the scope of long-term changes that occur in the brain years after a head injury or after multiple concussions. The cooperative awards form a partnership between NINDS, the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) and multiple academic medical centers.

NIH also will fund six pilot projects totaling just over \$2 million that will last up to two years and are designed to provide support for the early stages of sports-related concussion projects. If the

early results are encouraging, they may become the basis of more comprehensive projects. The NIH institutes responsible for managing these grants are NINDS, NICHD, and the National Institute on Deafness and Other Communication Disorders (NIDCD).

The eight projects were selected by the NIH following a rigorous scientific review process.

The cooperative awards bring together two teams of independent scientists to study and compare the brains of donors who were at high or low risk for developing long-term effects of TBI. Ten neuropathologists from eight universities will coordinate to describe the chronic effects of head injury in tissue from hundreds of individuals in order to develop standards for diagnosis.

The project includes four teams that will correlate brain scans with changes in brain tissue, using a variety of techniques. This may open the possibility of using these advanced brain imaging techniques to diagnose chronic effects of TBI in living individuals. The investigators in the two projects will also help NIH develop a registry dedicated to enrolling individuals with a history of TBI who are interested in donating brain and spinal cord tissue for study after their death. The new NIH Neurobiobank (<https://neurobiobank.nih.gov>) will coordinate the tissue collection, data gathering, and also distribute biospecimens, along with relevant information to enable other scientists to access this valuable tissue.

“The investigators will collaborate to develop diagnostic criteria for identifying the chronic features of the entire scope of brain trauma ranging from mild TBI to full-blown CTE, and then work to extend these criteria to living humans using some of the most advanced neuroimaging tools available,” said Walter Koroshetz, M.D., deputy director of NINDS.

“Although the two cooperative agreements focus on different aspects of TBI, their combined results promise to answer critical questions about the chronic effects of single versus repetitive injuries on the brain, how repetitive TBI might lead to CTE, how commonly these changes occur in an adult population, and how CTE relates to neurodegenerative disorders like Alzheimer’s disease,” Dr. Landis said.

The pilot studies will focus on improving the diagnosis of concussion and identifying potential biomarkers that can be used to track a person’s recovery:

- **Cortical GABA in Pediatric Sports Concussion**

Principal Investigator: Jeffrey G. Ojemann, M.D., Seattle Children’s Hospital

The brain contains numerous chemicals such as gamma-amino butyric acid (GABA), which is important for many brain functions, including cognition and movement, and may be altered by traumatic brain injury. Magnetic resonance (MR) spectroscopy is a scanning technique that can measure a variety of brain chemicals, including GABA. The goal of Dr. Ojemann’s project is to use MR spectroscopy to monitor GABA levels in adolescents who have sports-related concussions and compare those levels to uninjured controls. The researchers also will conduct preliminary comparisons of GABA levels with existing cognitive measures such as memory tests and structural brain imaging. Diagnostic tools that can reliably detect when the brain is injured and when it has recovered following a concussion are essential for determining when it is safe to resume normal activities.

###

The NINDS (<http://www.ninds.nih.gov>) is the nation's leading funder of research on the brain and nervous system. The NINDS mission is to reduce the burden of neurological disease – a burden borne by every age group, by every segment of society, by people all over the world.

The NICHD (<http://www.nichd.nih.gov>) sponsors research on development, before and after birth; maternal, child, and family health; reproductive biology and population issues; and medical rehabilitation.

The NIDCD (<http://www.nidcd.nih.gov>) supports and conducts research and research training on the normal and disordered processes of hearing, balance, taste, smell, voice, speech, and language and provides health information, based upon scientific discovery, to the public.

About the National Institutes of Health (NIH): NIH, the nation's medical research agency, includes 27 Institutes and Centers and is a component of the U.S. Department of Health and Human Services. NIH is the primary federal agency conducting and supporting basic, clinical, and translational medical research, and is investigating the causes, treatments, and cures for both common and rare diseases. For more information about NIH and its programs, visit <http://www.nih.gov>.

About the Foundation for the NIH (FNIH): Established by the United States Congress to support the mission of the NIH—improving health through scientific discovery in the search for cures—the Foundation for the NIH is a leader in identifying and addressing complex scientific and health issues. The foundation is a not-for-profit, 501(c)(3) charitable organization that raises private-sector funds for a broad portfolio of unique programs that complement and enhance NIH priorities and activities. For additional information about the Foundation for the NIH, please visit www.fnih.org.