Investigating Brain Injuries

Brian Head
Associate Professor, Anesthesiology

CURRENT RESEARCH

Exploring the causes of brain degeneration and using genetics to reverse that trend

Behaviorally, traumatic brain injury (TBI) or age-related neurodegeneration causes severe depression, anxiety, personality changes, increased aggression, social inappropriateness, and deficits in attention, cognition, sensory processing, and communication. These diseases are also non-genetic risk factors for neurological diseases such as chronic traumatic encephalopathy, Alzheimer's disease, Parkinson's disease, and depression. Dr. Head is using genetic intervention via viral vectors to reverse damage caused by TBI and age-related neurodegeneration, and is the only researcher in the world exploring such an approach. Therapeutic approaches have proven to be unsuccessful, and as a result these long-term disabilities lead to a greater requirement for institutional and long-term care. Therefore, there exists an urgent need for the development of more innovative methods to limit neurodegeneration and improve neurologic function after injury or in the aged brain. Evoking structural and functional neuroplasticity that in turn restores motor and cognitive function days to weeks to months after brain trauma remains a major medical challenge for treating millions of individuals.

The brain is easily the organ we rely on most to regulate the various functions of life, and brain injuries resulting from accidents or aging can prove to be debilitating and have lasting and dire consequences. Dr. Brian P. Head, Associate Professor in the Department of Anesthesia at the University of California, San Diego and at the Veterans Administration San Diego Healthcare System, is using genetic interventions (via viral vector gene therapy) to regenerate neuronal growth after traumatic brain injury (TBI, funded by NINDS) and in the aging...

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AFFILIATION

University of California, San Diego

EDUCATION

- Ph.D. in Molecular Pathology, 2005

University of California, San Diego

- M.S. in Marine Sciences, 2001

University of San Diego

- B.A. in Government, 1994

Georgetown University

AWARDS

- Presidential Early Career Award for Scientists and Engineers (PECASE), 2014

RESEARCH AREAS

Life Science, Neurological / Cognitive, Regenerative Medicine, Veteran's Causes

FUNDING REQUEST

Your contributions will allow the gene therapy being researched to be taken into the developmental drug phase, and potentially into Phase-1 clinical trials, which are extremely costly. Acquiring vectors for human use, preparation for good manufacturing practice (GMP) grade, and a porcine large animal brain injury model are large costs associated with the progression of Dr. Head's research, and are needed for advancing potentially successful treatments of TBI's.