

Military service members face unique and sustained threats to optimal brain health

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Military service exposes soldiers to a unique set of physical challenges, including toxic chemicals and traumatic brain injury, which can have profound effects on their health and well-being. New research examines the effects of military-related brain disorders and possible paths toward treatment, as well as a potential way to harness our brain's learning capabilities to better train pilots. The studies were presented today at Neuroscience 2017, the annual meeting of the Society for Neuroscience and the world's largest source of emerging news about brain science and health.

More than 21 million Americans are military veterans, and a growing number of them are grappling with the lifelong physical and cognitive effects of [brain](#) injuries. Neuroscientists are continuing to improve our understanding of these stressors on soldiers' health, with the goal of improving life for veterans to the greatest extent possible.

Today's new findings show that:

- Novice military aviators can improve their visual responses to challenging environments by observing how expert pilots move their eyes (Stephen Macknik, abstract 493.01, see attached summary).
- Blast-induced [traumatic brain injury](#) enlarges the amygdala, damages the frontal lobe, and accelerates patterns of brain aging in rats (Alaa Kamnaksh, abstract 107.03, see attached summary).
- Transplanted [neural stem cells](#) can help replace and protect brain tissue damaged by severe traumatic brain injury in rats (Shyam Gajavelli, abstract 336.11, see attached summary).
- Widespread disruptions in communication among brain networks may underlie commonly reported symptoms of Gulf War Illness, including changes in visual

processing, language function, pain perception, and mood regulation (Kaundinya Gopinath, abstract 456.09, see attached summary).

Other recently published research shows that:

- A molecule that stabilizes a critical structural component of neurons reverses some of the cellular effects seen in cultured neurons exposed to a chemical related to sarin (Ankita Patil, abstract 71.06, see attached summary)

"Our soldiers have already given so much only to then face especially challenging lives after leaving the battlefield," said Colonel Deborah Whitmer, DVM, PhD, of the Walter Reed Army Institute of Research. "These studies improve our understanding of risks to brain function because of unique combat hazards as well as offer hope for potential treatments and enhancement of adaptation and learning."

Provided by Society for Neuroscience

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