USF study finds stem cell combination therapy improves traumatic brain injury outcomes

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_Umbilical cord cell and growth factor treatment tested in animal models could offer hope for millions, including U.S. war veterans with traumatic brain injuries_

Tampa, FL – Traumatic brain injuries (TBI), sustained by close to 2 million Americans annually, including military personnel, are debilitating and devastating for patients and their families. Regardless of severity, those with TBI can suffer a range of motor, behavioral, intellectual and cognitive disabilities over the short or long term. Sadly, clinical treatments for TBI are few and largely ineffective.

In an effort to find an effective therapy, neuroscientists at the Center of Excellence for Aging and Brain Repair, Department of Neurosurgery in the USF Health Morsani College of Medicine, University of South Florida, have conducted several preclinical studies aimed at finding combination therapies to improve TBI outcomes.

In their study of several different therapies—alone and in combination—applied to laboratory rats modeled with TBI, USF researchers found that a combination of human umbilical cord blood cells (hUBCs) and granulocyte colony stimulating factor (G-CSF), a growth factor, was more therapeutic than either administered alone, or each with saline, or saline alone.

The study appeared in a recent issue of PLoS ONE.

"Chronic TBI is typically associated with major secondary molecular injuries, including chronic neuroinflammation, which not only contribute to the death of neuronal cells in the central nervous system, but also impede any natural repair mechanism," said study lead author Cesar V. Borlongan, PhD, professor of neurosurgery and director of USF's Center of Excellence for Aging and Brain Repair. "In our study, we used hUBCs and G-CSF alone and in combination. In previous studies, hUBCs have been shown to suppress inflammation, and G-CSF is currently being investigated as a potential therapeutic agent for patients with stroke or Alzheimer's disease."
