Medical Xpress

Experimental drug may limit harmful effects of traumatic brain injury

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A new report by University of Kentucky researcher Linda Van Eldik, PhD, describes an experimental drug candidate that may aid patients with traumatic brain injury (TBI).

The article appeared this week in the journal *PLoS One*, the world's largest biology journal.

According to the Centers for Disease Control and Prevention (CDC), falls, motor vehicle collisions, and assault make up the most common causes of TBI. Symptoms of TBI, which include impaired cognition, memory, and motor control, may be temporary or permanent depending on the severity of the injury.

"Following a head injury, the body mobilizes immune cells to respond to the trauma and jump-start the healing process," Van Eldik said. "Although these immune cells help repair the injury, they also cause inflammation that may damage the tissue—a sort of double-edged sword."

"Our goal is to find ways to improve the positive effects of the immune system while thwarting the inflammation process that damages tissues," she said.

Van Eldik's laboratory identified and began testing the experimental drug MW151 in 2007. In initial testing, MW151 appeared to inhibit the release of the "bad" chemicals that caused inflammation while

preserving immune cells' repair capabilities in a form of TBI known as a closed head injury. Further evidence of MW151's effectiveness was manifested in reduced cognitive impairment.

The current work described in *PLoS One* tested MW151 in a second, more serious form of TBI known as mFPI.

"We were delighted to see that MW151 is effective in more than one model of TBI," said Adam Bachstetter, PhD, assistant professor in the Spinal Cord & Brain Injury Research Center (SCoBIRC) and the Department of Anatomy & Neurobiology at the University of Kentucky and the lead author for the *PLoS One* article. "MW151 appears to dampen down the detrimental inflammatory responses without suppressing the normal functions that the cells need to maintain health."

According to Van Eldik, who is director of the Sanders-Brown Center on Aging at the University of Kentucky, the potential impact of this treatment is significant.

"Traumatic brain injury represents a major unmet medical need, as there is currently no effective therapy to prevent the increased risk of dementia and other neurologic complications, such as post-traumatic epilepsy, neuropsychiatric disorders, and post concussive symptoms such as headaches, sleep disturbances, memory problems, dizziness, and irritability," she said.

"MW151 represents an important next step in the process to help people with TBI, including soldiers, athletes, car accident victims and others."

Van Eldik hopes to move MW151 into clinical trials in the next few years.