

Exercise may help prevent brain damage caused by Alzheimer's disease

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Regular exercise could help prevent brain damage associated with neurodegenerative diseases like Alzheimer's, according to research published this month in Elsevier's journal *Brain, Behavior, and Immunity*.

"Exercise allows the brain to rapidly produce chemicals that prevent damaging inflammation", said Professor Jean Harry, who led the study at the National Institute of Environmental Health Sciences in the United States. "This could help us develop a therapeutic approach for early intervention in preventing damage to the brain."

Previous research has already demonstrated that exercise after brain injury can help the repair mechanisms. This new study shows that exercise before the onset of damage modifies the brain environment in such a way that the neurons are protected from severe insults. The study used an experimental model of [brain damage](#), in which mice are exposed to a chemical that destroys the hippocampus, an area of the brain which controls [learning and memory](#). Mice that were exercised regularly prior to exposure produced an immune messenger called interleukin-6 in the brain, which dampens the harmful inflammatory response to this damage, and prevents the loss of function that is usually observed.

Pharmacological therapies to downregulate inflammation and address [cognitive decline](#) in older adults, and those with Alzheimer's disease, have been less successful. This research helps understand how exercise could be used to affect the path of many human conditions, such as

[neurodevelopmental disorders](#) and [neurodegenerative diseases](#). In addition, as a chemical model of neuronal damage was used, it also raises the possibility that exercise could offer protection against the potentially harmful effects of environmental toxins.

"This elegant series of experiments reveals an alternative pathway by which voluntary [physical exercise](#) may protect hippocampal neurons", said Dr. Ruth Barrientos from the Department of Psychology and Neuroscience at the University of Colorado. "The study on the role of exercise as a therapeutic intervention will undoubtedly get a workout in the years to come. Perhaps the greatest challenge with this line of research will not be more discoveries of compelling evidence of the anti-neuroinflammatory effects of exercise, but instead, getting humans to exercise voluntarily and regularly."

More information: The article is "Voluntary exercise protects hippocampal neurons from trimethyltin injury: Possible role of interleukin-6 to modulate tumor necrosis factor receptor-mediated neurotoxicity" by Jason A. Funk, Julia Gohlke, Andrew D. Kraft, Christopher A. McPherson and Jennifer B. Collins. The article appears in *Brain, Behavior, and Immunity*, Volume 25, Number 6 (August 2011).

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