



Canine Sports Productions

Chris Zink DVM PhD DACVP DACVSMR CCRT CVSMT CVA

Coaching dog enthusiasts to embrace the unique needs of active dogs through teaching, mentoring and educational media

Articles About the Effects of Exercise and Neurogenesis

van Praag H. Neurogenesis and exercise: past and future directions. *Neuromolecular Med.* 2008;10(2):128-40. doi: 10.1007/s12017-008-8028-z.

Abstract

Research in humans and animals has shown that exercise improves mood and cognition. Physical activity also causes a robust increase in neurogenesis in the dentate gyrus of the hippocampus, a brain area important for learning and memory. The positive correlation between running and neurogenesis has raised the hypothesis that the new hippocampal neurons may mediate, in part, improved learning associated with exercise. The present review gives an overview of research pertaining to exercise-induced cell genesis, its possible relevance to memory function and the cellular mechanisms that may be involved in this process.

van Praag H, Christie BR, Sejnowski TJ, Gage FH. Running enhances neurogenesis, learning, and long-term potentiation in mice. *Proc Natl Acad Sci U S A.* 1999 Nov 9;96(23):13427-31.

Abstract

Running increases neurogenesis in the dentate gyrus of the hippocampus, a brain structure that is important for memory function. Consequently, spatial learning and longterm potentiation (LTP) were tested in groups of mice housed either with a running wheel (runners) or under standard conditions (controls). Mice were injected with bromodeoxyuridine to label dividing cells and trained in the Morris water maze. LTP was studied in the dentate gyrus and area CA1 in hippocampal slices from these mice. Running improved water maze performance, increased bromodeoxyuridine-positive cell numbers, and selectively enhanced dentate gyrus LTP. Our results indicate that physical activity can regulate hippocampal neurogenesis, synaptic plasticity, and learning.

You can get the full article free here: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC23964/>