Exercise: a behavioral intervention to enhance brain health and plasticity

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Extensive research on humans suggests that exercise could have benefits for overall health and cognitive function, particularly in later life. Recent studies using animal models have been directed towards understanding the neurobiological bases of these benefits. It is now clear that voluntary exercise can increase levels of brain-derived neurotrophic factor (BDNF) and other growth factors, stimulate neurogenesis, increase resistance to brain insult and improve learning and mental performance. Recently, high-density oligonucleotide microarray analysis has demonstrated that, in addition to increasing levels of BDNF, exercise mobilizes gene expression profiles that would be predicted to benefit brain plasticity processes. Thus, exercise could provide a simple means to maintain brain function and promote brain plasticity.