



**Is the neurogenesis the clue to understanding antidepressive effect of aerobic exercise? Signaling pathways might be the answer.**

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Neurogenesis is the process by which new neurons are generated from progenitor cells or neural stem cells. Recent evidence clearly shows that adult brains are able to show migration of these cells and integrate into previously established circuits. However, this de novo plasticity is very discrete especially in higher mammals (rhesus macacus and homo sapiens), therefore, it is highly debatable whether both the generation and incorporation of new neurons have a clear behavioral value in certain species. Our laboratory has shown that in murines (mus musculus) this generation is highly functional and is related to specific behavioral improvements in spatial and working memory (Morris water maze). In parallel, we have shown that the performance of voluntary exercise by rodents, improves the rate of neurogenesis at the level of the hippocampus and is able to reverse behavioral

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We report that voluntary wheel running for 10 weeks decreased A $\beta$  burden and A $\beta$  oligomers in the hippocampus. These findings support that voluntary exercise might have therapeutic value on AD and depressive disorders.