

## Reports

# Altered Histone Acetylation Is Associated with Age-Dependent Memory Impairment in Mice

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As the human life span increases, the number of people suffering from cognitive decline is rising dramatically. The mechanisms underlying age-associated memory impairment are, however, not understood. Here we show that memory disturbances in the aging brain of the mouse are associated with altered hippocampal chromatin plasticity. During learning, aged mice display a specific deregulation of histone H4 lysine 12 (H4K12) acetylation and fail to initiate a hippocampal gene expression program associated with memory consolidation. Restoration of physiological H4K12 acetylation reinstates the expression of learning-induced genes and leads to the recovery of cognitive abilities. Our data suggest that deregulated H4K12 acetylation may represent an early biomarker of an impaired genome-environment interaction in the aging mouse brain.

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