Reports

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

Shahaf Peleg,1,* Farahnaz Sananbenesi,1,* Athanasios Zovoilis,1,* Susanne Burkhardt,1 Sanaz Bahari-Javan,1 Roberto Carlos Agis-Balboa,1 Perla Cota,1 Jessica Lee Wittnam,1,† Andreas Gogol-Doering,2 Lennart Opitz,3 Gabriella Salinas-Riester,3 Markus Dettenhofer,4 Hui Kang,2 Laurent Farinelli,5 Wei Chen,2 André Fischer1,‡

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.

1 Laboratory for Aging and Cognitive Diseases, European Neuroscience Institute, Grisebach Str. 5, D-37077 Goettingen, Germany.
2 Max Delbrueck Center for Molecular Medicine, Institute for Medical Systems Biology, Robert-Rössle-Strasse 10, D-13125 Berlin-Buch, Germany.
3 DNA Microarray Facility, Georg August University, Humboldtallee 23, D-37073 Goettingen, Germany.
4 Harvard Medical School, Genetics Department, 77 Ave Louis Pasteur, Boston, MA 02115, USA.
5 Fasteris SA, CH-1228 Plan-les-Ouates, Switzerland.

* These authors contributed equally to this work.
† Present address: Department of Psychiatry, Division of Molecular Psychiatry, University Goettingen, von Siebold Str. 7, D-37075 Goettingen, Germany.
‡ To whom correspondence should be addressed. E-mail: a.fischer@eni-g.de

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