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*Research Article*

# Neural Differentiation in HDAC1-Depleted Cells Is Accompanied by Coilin Downregulation and the Accumulation of Cajal Bodies in Nucleoli

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Cajal bodies (CBs) are important compartments containing accumulated proteins that preferentially regulate RNA-related nuclear events, including splicing. Here, we studied the nuclear distribution pattern of CBs in neurogenesis, and we observed the appearance of a single robust CB in the nuclei of cells at the cortex periphery of embryonic brains. In adult brains, coilin was present at a high density, but, for example, CB formation was absent in the nuclei of the choroid plexus of the lateral ventricles. Cells of the adult hippocampus were characterized by a crescent-like morphology that is attributable to the accumulated coilin protein. Interestingly, we also observed a 70 kDa splice variant of coilin in adult mouse brains. The 80 kDa standard variant of coilin was detected by western blotting in e13.5–18.5 embryonic brains and in mouse pluripotent embryonic stem cells (mESCs). When we induced neural differentiation in wild-type mESCs, the coilin level was reduced. The depletion of coilin was pronounced during neural differentiation of histone deacetylase 1 (HDAC1) double-knockout (dn) mESCs that we analyzed due to an importance of HDAC1 in neurogenesis. Here, in neural differentiation pathway, HDAC1 deficiency caused the appearance of accumulated coilin inside the fibrillarin-positive region of the nucleoli. A similar distribution pattern was observed in adult brain hippocampi, characterized by lower levels of both coilin and HDAC1. In summary, it is highly probable that, due to the differentiation processes and changes in chromatin accessibility induced by HDAC1 deficiency, the coilin protein is depleted and accumulated in body-like structures inside the nucleoli.