HOMOCYSTEINE ALTERS PHOSPHORYLATION OF INTERMEDIATE FILAMENT PROTEINS FROM HIPPOCAMPUS AND CEREBRAL CORTEX OF RATS

Oliveira-Loureiro, S., Heimfarth, L., de Lima Pelaez, P., Viana, L., Ariane Zamoner, Wyse, A.T.S., Pessoa-Pureur, R.
Departamento de Bioquímica, ICBS, UFRGS, Porto Alegre, RS, Brazil,

Homocysteine (Hcy), a thiol-containing amino acid derived from the metabolism of methionine, markedly enhances the vulnerability of neuronal cells to excitotoxic and oxidative insults. Evidences show that high Hcy levels contribute to neuronal cell injury in various pathological conditions, however the cellular and molecular mechanisms by which hyperhomocysteinemia contributes to neurodegeneration are poorly understood. In the present study we investigated the effects of Hcy on the in vitro incorporation of ^{32}P into intermediate filament (IF) proteins from cerebral cortex and hippocampal slices of 9-29 day-old rats. Tissue slices were incubated with ^{32}P orthophosphate in the presence or absence of 100 and 500 μM Hcy. The intermediate filament enriched cytoskeletal fraction was isolated and the radioactivity incorporated into the neurofilament subunits, vimentin and glial fibrillary acidic protein was measured. Our results demonstrate that 100 μM Hcy increased the in vitro incorporation of ^{32}P into IF proteins from cerebral cortex and hippocampal slices of 17 day-old rats. However, 500 μM Hcy decreases the incorporation of ^{32}P from hippocampal slices of 17 an 21 day-old rats. Considering that abnormal phosphorylation levels of cytoskeletal proteins is associated with neurodegeneration, our results support the involvement of the cytoskeleton in the neural damage induced by Hcy.

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