P-03

Neural gene modulations in kainate-treated adult mouse brain

Sung Sik Choi, Chang Nam Hwang, Sung Soo Park and Sang Ho Lee

Graduate School of Life Sciences and Biotechnology, Korea University, Seoul 136-701, Korea

Abstract

Kainate has been extensively used to study cellular and physiological mechanisms underlying epileptic seizure in animal model for human epilepsy. Despite the extensive studies, no report has demonstrated region-specific alterations in the brain of the model mouse. We examined several neural and stress-related genes to explore whether any region-specific alterations occurs in their expressions after the kainate treatment. Intermediate filament genes including nestin, neurofilament, GFAP and vimentin, two SNAREs including SNAP-25 and synaptotagmin (syt) and synaptobrevin vesicle-associated. membrane protein (VAMP), and HSP70 were examined at the levels of transcript and protein expression. Transcripts and protein expression by kainate effects presented different profiles by tissue specificity. These genes were up- and down-regulated in the hippocampus, the cerebral cortex and the cerebellum after kainate administration. Intermediate filaments were up-regulated at 24h post-kainate injection as shown by RT-PCR and then upregulated as shown by protein expression level. And then the neural genes gradually returned to the level of control group at 1 week post-kainate injection. RT-PCR analyses also demonstrated that the neural genes were up- or down-regulated in time course of kainate injection, HSP70 was upregulated at 12 and 24h after the kainate treatment. However, VAMP showed different expression pattern in time course in the three tissues. GFAP and vimentin showed slight alterations in their expression levels in the cerebellum. From these results, it was

suggested that kainate modulate neural genes, and HSP70 specifically in time- and region-dependent manners, and that kainate injection may cause cell death and then activate neural stem cells, followed by neural maturation as evidenced by the expression levels of nestin, GFAP, SNAP-25 and NF-M.

Keywords : ***kainate, epilepsy, neural genes, SNAREs, mouse brain***