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CLONING AND EXPRESSION OF MP13, A NEW FACTOR RELATED TO GTP REGULATION

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Epilepsy is one of the most common forms of nervous disease. It is caused by genetic and environment factors, such as genetic defect, damage in brain and nervousness by stress or scare. Kainic acid (KA) induces seizures and has been widely used as an animal model for human temporal lobe epilepsy. Our preliminary study showed that long-term induced genes in hippocampus play an important role in the regulation of recurrent seizures induced by KA treatment. In order to identify this long-term FRA, we have constructed a cDNA library derived from the hippocampus 6 weeks after KA treatment and screened it with an antibody raised against the highly conserved M-peptide region of c-Fos and the other FRA. A gene, MP13, was cloned and it contained a 1662 bp open reading frame which coded for a 554-amino-acid protein. The expressed MP13 protein was specifically recognized by the M-peptide antibody but not by c-Fos, Fos B, Fra1, and Fra2 antibodies. Sequence analysis revealed that MP13 has a leucine zipper region, a glutamine repeat region, and has high sequence similarity to the activator of the small GTPase Rab5. Gel retardation analysis for the translated MP13 protein in vitro revealed that the binding of the MP13 protein to other proteins was GTP related. These results suggested that MP13 functions as a GTP related factor.

S-N-5

IN VIVO STUDY OF NEUROPEPTIDE Y IN FOCAL CEREBRAL ISCHAEMIA

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Background and Purpose: Neuropeptide Y (NPY), an endogenous peptide neurotransmitter, has been implicated in the regulation of many physiological functions and in the pathogenesis of many human diseases. Previous middle cerebral artery occlusion (MCAO) experiments have shown an increase in NPY within the peri-infarct cortex. We studied the effects of exogenous NPY on infarction volume.
Methods: Adult male Sprague-Dawley rats were anaesthetised with sodium pentobarbital to undergo reversible right-sided endovascular MCAO for 2 hours. NPY or vehicle was given via one of three ways: intracarotid injection (10 μg/kg) at the beginning of reperfusion; intracisternal injection (10 or 30 μg/kg) at 30 minutes of ischaemia; intra-cerebroventricular (ICV) injection (10 μg/kg) at 30 min of ischaemia. Body temperature was maintained constant, and haemodynamic parameters were monitored during anaesthesia. Laser doppler flowmetry (LDF) was used to record cerebral blood flow (CBF) during ischaemia and reperfusion. The rats were decapitated on day 3, and their brains were cut into 2-mm thick coronal slices before staining with 2% triphenyltetrazolium chloride for determination of infarction volume.
Results: The relative infarction volumes in the NPY-treated rats were 40.0± 4.7% (mean± SEM; 10 rats) after intracarotid injection, and 30.3± 5.1% (9 rats) after ICV injection, whereas the infarction volumes were smaller in the control rats (24.0± 3.1% [7 rats] in intracarotid controls and 15.7± 3.6% [7 rats] in ICV controls; $P < 0.05$, 2-tailed student's t test). Following intra-cisternal injection of NPY, the relative infarction volumes were 27.8± 3.4% (10 μg/kg; 11 rats) and 29.5± 3.7% (30 μg/kg; 12 rats), which were not significantly different from that of control group (21.6± 3.1%; 8 rats). A major reduction in CBF during reperfusion was observed, especially after intra-carotid or ICV injection.
Conclusions: Exogenous NPY administered by intra-carotid or ICV injection increases the infarction volume. Data from laser Doppler flowmetry indicates that NPY injection produces a significant reduction in CBF during reperfusion.