Cognitive Neuroscience and Stroke

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Recombinant adeno-associated virus vectors are becoming the most commonly used gene therapy vectors for central nervous system diseases. Here we investigated the expression of *LacZ* gene mediated by intravenous single-stranded adeno-associated virus (ssAAV9) in the brain and whether it can be transfected into astrocyte, neurons and vascular endothelial cells. We further identified the hypoxic response element (HRE) could regulated the expression of target genes mainly in the cerebral ischemic region.

A mouse model of permanent left middle cerebral artery occlusion (dMCAO) was established. Diaminobenzidine staining and Western blotting were used to detect the expression of hypoxia inducible factor (Hif) -1 in cerebral ischemic area 1 and 5 days after dMCAO. The ssAAV vector containing HRE-regulated beta-galactosidase gene (AAV9-H9LacZ) was packaged into the capsid of AAV9 virus, and AAV9-H9LacZ was injected into mice through jugular vein one hour after the establishment of dMCAO model. Five days

The expression of Hif-1 was increased on the 1st and 5th day of cerebral ischemia. LacZ was mainly expressed in ischemic penumbra of mice in AAV9-H9LacZ group. There was no positive expression of β-gal in the liver of AAV9-H9LacZ mice. LacZ positive cells mainly co-expressed with GFAP positive cells, and a few co-expressed with NeuN positive cells.

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