

RESEARCH INTERESTS - ZUO

The research focuses in our laboratory are two: the regulation of glutamate transporters and neuroprotection.

Glutamate is a major excitatory neurotransmitter. Glutamate is also a toxin when its extracellular concentration is high. Glutamate transporters are membrane proteins, which transport glutamate from extracellular to intracellular space under physiological conditions. This process has been found to play an important role in maintaining extracellular glutamate homeostasis. Five glutamate transporters have been characterized so far. We are interested in studying by what and how the activity and protein expression of glutamate transporters can be regulated. We use cell culture (including C6 cells, glial and neuronal cultures) and brain slices, and employ pharmacology, physiology and biochemistry methods in our studies.

Ischemia causes cell death. Ischemic brain injury is implicated in the pathophysiology of many human diseases including stroke. Excessive extracellular glutamate accumulation during ischemia has been thought to be an important mechanism for ischemic brain injury. Many agents or methods have been found to be neuroprotective. We are interested in studying the protective effects of ischemic preconditioning and volatile anesthetics in the central nervous system. We use both in vitro and in vivo brain ischemia models to study the mechanisms of these neuroprotective methods.

GRANT SUPPORT

1RO1 GM65211-01A (Zuo) 02/01/2003 - 1/30/2008 NIH/NIGM Volatile anesthetic modulation of glutamate transporters.

1RO1 NS045983-01A (Zuo) 1/1/2004-12/30/2007 NIH/NIDDS Neuroprotection after isoflurane preconditioning.