List of Main Research Fields in Department of Neurosurgery, Kagoshima University

2014.5.29

A. Mechanism of epileptogenesis in rat epilepsy model

1. Hippocampal cell loss and propagation of abnormal discharges in the spontaneously epileptic rat.
2. Modulation of abnormal synaptic transmission in hippocampal CA3 neurons of spontaneously epileptic rats.
3. Distribution of synaptic vesicle protein 2A and synaptotagimin-1 in the cerebral cortex and hippocampus of spontaneously epileptic rats
4. Neuroprotective effect of levetiracetam on hippocampal sclerosis in spontaneous epilepsy rat.
5. Effects of levetiracetam on the high-voltage-activated L-type Ca2+ channels in hippocampal CA3 neurons of spontaneously epileptic rats

B. Search for epileptogenic focus in human intractable epilepsy

1. Search of epileptogenetic focus in human using magnetoencephalogram (MEG) and positron emission tomography (PET)
2. Eletrocorticographic-histopathologic correlations implying epileptogenicity associated with of benign brain tumor

C. Mechanism of invasion and chemotherapy-resistance of malignant glioma

1. Wnt-5a signaling in malignant gliomas
2. Immunoreactivity of Wnt5a, Fzd2, Fzd6, and Ryk in glioblastoma: evaluative methodology for DAB chromogenic immunostaining.
3. Significance of Ryk expression in Wnt-5a-dependent invasiveness in human glioma.
4. Role of sonic hedgehog signaling in migration in CD133-positive malignant glioma cells.
5. The role of MLH1 and PMS2 in temozolomide resistance and recurrence of glioblastoma

D. Role of C-type natriuretic peptide in central nervous system

1. Relationship between C-type natriuretic peptide and pituitary adenylate cyclase in rat astrocytes.
2. Role of C-type natriuretic peptide on blood-brain barrier.

E. Mechanism and control of central neuropathic pain

1. Development and pharmacological verification of a new mouse model of central post-stroke pain.
2. Involvement of free fatty acid receptor GPR40 in the regulation of spinal nocicieptive transmission

F. Pathomechanism of clinical presentations and long-term result of treatment of neuroendocrine tumors.

1. Significance of existence of CD133+ cells in pituitary adenomas.
2. Natural course of incidentally found nonfunctioning pituitary adenoma
3. Mechanism of post-operative hyponatremia in patients with pituitary adenoma
4. Longitudinal changes in blood IGF-1 levels after transsphenoidal adenomectomy of GH producing pituitary adenomas
5. Growth hormone secretory function in postoperative acromegalic patients.
6. Transsphenoidal surgical treatment of pituitary adenomas in patients aged 80 years or older

G. MRI diagnosis of neuroendocrine tumors

1. Role of advanced magnetic resonance imaging in the evaluation of pituitary adenomas.
2. Geometric survey on magnetic resonance imaging of growth hormone producing pituitary adenoma.

H. Clinical neurophysiology in neurosurgical field

1. Excitability changes of human motor cortex evaluated by transcranial magnetic stimulation
2. Noninvasive determination of speech dominancy by magnetic stimulation
3. Intraoperative monitoring of facial motor evoked potentials in acoustic neuroma surgery
4. Electrophysiological mapping of the temporal branch of the facial nerve

I. Clinical features of distal cerebral aneurysms

1. Clinical presentation and treatment of distal posterior cerebellar artery aneurysms
2. Clinical presentation and treatment of distal anterior cerebellar artery aneurysms
3. Anatomical features of distal anterior cerebral artery aneurysms

J. Biological characteristics of acoustic neuroma

1. Intratumoral distribution of proliferative index in acoustic neuroma