# Neurosurgery

## 1. Staffs and Students (October 2009)

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|---|---|---|
| Professor: | Kikuo Ohno | |
| Associate Professor: | Masaru Aoyagi | |
| Assistant Professors: | Tadashi Nariai, | Taketoshi Maehara |
| Hospital staffs: | Yoshikazu Yoshino, | Yoji Tanaka, |
| | Kyoko Sumiyoshi, | Yoshihisa Kawano, |
| | Maki Mukawa, | Hirokazu Nagasaki, |
| | Masahumi Sasaki, | Kana Sawada. |
| Secretary: | Mariko Tasumi, | Mayako Tokunaga. |
| Graduate Students: | Keigo Shigeta, | Tomoaki Okada, |
| | Yoshiyuki Matsuoka, | Yoshihisa Kawano, |
| | Toshiya Momose, | Iwae Yu, |
| | Mutsumi Fujii, | Shin Hirota, |
| | Tomoyuki Kino, | Takumi Kudoh, |
| | Kotaro Kumagai, | Chihiro Hosoda, |
| | Mullah Saad Habib-E-Rasul, | Tomoyuki Nakamura, |
| | Takashi Shigematsu, | Atsuko Ishibashi, |
| | Ritsu Nishimura | |

## 2. Purpose of Education

There are various attracting subjects in the field of clinical or basic research. It is essential to acquire the sufficient knowledge and insight into the pathological conditions as well as normal functions of the central nervous system and spinal cord, which will directly benefit for the improvement of clinical results. Main educational purpose of neurosurgery in the graduate course is to provide students opportunity to acquire the proper technique as well as the broad knowledge, and to nurture the mind of exploration.

In the clinical practice, it is important to attach priority to the patients, considering their background. Also in surgery, it is important to preserve the normal brain functions by employing the cutting edge technique. In the research field, it is essential to introduce and develop the latest knowledge and technology by establishing the reciprocal relationship with the other laboratory institutions.

## 3. Research Subjects

### Brain tumors

1. Analysis of the mechanism of tumor proliferation and infiltration, and its application to treatment
2. Analysis of both proliferative and inhibitory cancer genes in cerebral and spinal tumors
3. Studies of photodynamic therapy, irradiation therapy, agents of chemotherapy, immunotherapy, and inhibition of angiogenesis
4. Development of the multi-modal navigation system integrated with anatomical, hemodynamic, and functional information for brain tumor surgery and evaluate its efficacy.

### Vascular diseases in the central nervous system and spinal cord

1. Analysis of pathogenesis of vasospasm after subarachnoid hemorrhage and its application to treatment
2. Studies of circulatory disturbance in ischemic and hemorrhagic diseases, and reversibility of the brain tissue
3. Investigations of pathology of Moyamoya disease and the effects of indirect surgical anastomosis on this entity
4. Solutions of problems in the development of endovascular surgery

### Neurotrauma

1. Analysis of cell damage and its reversibility, dynamic simulation in cerebrospinal injury
2. Animal experiments concerning treatment of cerebrospinal injury

### Functional neurosurgery

1. Pathological analysis and treatment of temporal lobe epilepsy
2. Analysis of intracellular signal transductions

### Others

1. Studies of human cerebral circulation, metabolism, and functions using PET, MRI/S, and MEG

2. Studies of receptors in the central nervous system using PET
3. Experiments of brain diseases using animal model MRI and PET

## 4. Clinical services

Neurosurgery is a clinical department dealing with various diseases of central nervous system and spinal cord including tumors, vascular diseases, trauma, congenital malformation, functional disorders, and infection.

## 5. Publications

### Original Articles


1. Bao Y, Sumita K, Kudo T, Withanage K, Nakagawa K, Ikeda M, Ohno K, Wang Y, Hata Y: Roles of mammalian sterile 20-like kinase 2-dependent phosphorylations of Mps one binder 1B in the activation of nuclear Dbf2-related kinases. Genes Cells 14(12):1369-82 2009
2. Hara M, Tamaki M, Aoyagi M, Ohno K: Possible role of cyclooxygenase-2 in developing chronic subdural hematoma. J Med Dent Sci 56:101-106, 2009
3. Nariai T, Ishiwata K, Kimura Y, Inaji M, Momose T, Yamamoto T, Matsumura A, Ishii K, Ohno K. PET pharmacokinetic analysis to estimate boron concentration in tumor and brain as a guide to plan BNCT for malignant cerebral glioma. Appl Radiat Isot, 67: S348-50. 2009
4. Nojiri T, Nariai T, Aoyagi M, Senda M, Ishii K, Ishiwata K, Ohno K: Contributions of biological tumor parameters to the incorporation rate of L: -[methyl-(11)C] methionine into astrocytomas and oligodendrogliomas. J Neurooncol 93:233-241, 2009
5. Sampetrean O, Iida S, Makino S, Matsuzaki Y, Ohno K and Saya H : Reversible whole-organism cell cycle arrest in a living vertebrate, Cell Cycle 15;8(4):620-7, 2009
6. Tanaka Y, Nariai T, Momose T, Aoyagi M, Maehara T, Tomori T, Yoshino Y, Nagaoka T, Ishiwata K, Ishii K, Ohno K: Glioma surgery using a multimodal navigation system with integrated metabolic images. J Neurosurg 110:163-172, 2009
7. Nakagawa K, Aoyagi M, Inaji M, Maehara T, Toriyama H, Kawano Y, Tamaki M, Nariai T, Ohno K: The usefulness of whole body FDG-PET/CT in patients with brain metastasis. No Shinkei Geka. 37: 159-166, 2009. (In Japanese)
8. Nakagawa K, Aoyagi M, Kawano Y, Ohno K: Clinical and operative findings in patients with trigeminal neuralgia caused by brain tumors. No Shinkei Geka. Sep;37(9):863-71 2009. (In Japanese)
9. Nakagawa K, Aoyagi M, Inaji M, Maehara T, Toriyama H, Kawano Y, Tamaki M, Nariai T, Ohno K: Clinical and serial angiographic study in patients with subarachnoid hemorrhage of unknown etiology with special reference to the clot distribution of perimesencephalic nonaneurysmal subarachnoid hemorrhage. No Shinkei Geka. Aug;37(8):771-8 2009. (In Japanese)