

## 79

QUANTITATIVE SPIROPERIDOL RECEPTOR  
AUTORADIOGRAPHY IN THE RAT BRAIN.

H.Mori, K.Shiba, H.Matsuda, S.Tsuji, K.Hisada  
and K.Kojima. Kanazawa University, Kanazawa.

The kinetic and pharmacological characteristics of H-3 spiroperidol binding sites were studied in slide mounted sections of rat forebrain and optical labeling conditions were determined. Using the receptor autoradiographic technique with tritium-sensitive LKB sheet film, the distribution and the binding parameters of D-2 and S-2 receptor were determined in various regions of the rat brain. The autoradiograms were analyzed using Video Digitizer System combined with video camera and minicomputer and the subtraction images were obtained.

These studies suggest that this quantitative receptor autoradiography might be useful in the explanation of etiology in the field of neuro-psychiatric disease and the fundamental studies of positron CT, since this method has several advantages over in vivo autoradiography and receptor assay.

## 80

<sup>11</sup>C-N,N-DIMETHYLTRYPTAMINE : A NEW RADIO-PHARMACEUTICAL FOR THE BRAIN IMAGING.

K.Yanai, K.Ishiwata, T.Ido, J.Hatazawa\*, T.Matsuzawa\*, T.Takahashi, K.Kawashima, and R.Iwata. Cyclotron and Radioisotope Center, \*Research Institute for Tuberculosis and Cancer, Tohoku University, Sendai.

Endogenous hallucinogen, N,N-dimethyl-tryptamine(DMT) was labeled with carbon-11. The subcellular distribution of <sup>11</sup>C-DMT revealed the proportions of radioactivity in the nuclear, crude mitochondrial, and microsomal fractions were high in a low loading dose. The proportion of radioactivity in the three fractions were greatly enhanced by the pretreatment with monoamine oxidase inhibitor pargyline. <sup>11</sup>C-DMT is expected to have two distinct pools in the brain. Pool-1 is associated with serotonin receptors and <sup>11</sup>C-DMT accumulates in the pool-1 when loading dose of DMT is low and/or the metabolism is inhibited. Preliminary positron emission tomographic study in a dog was presented. In the displacement study the radioactivity in the striatum was decreased rapidly after 5-methoxy-N,N-dimethyltryptamine(1 mg) injection, followed by a lower constant level. On the other hand the calculated concentration was not altered in the posterior cerebral cortex. These regional difference correlated well with the distribution and density of serotonin receptors in in vitro experiments. The results demonstrated serotonin receptors(pool-1) could be detected in the live dog with <sup>11</sup>C-DMT.

## 81

CEREBRAL HYPEREMIA IN HEAD INJURED  
PATIENTS. T.Sakamoto, M.Taneda. Hanwa Memorial  
Hospital, Osaka.

Cerebral blood flow (CBF) measurements were performed in 33 patients with head injuries by xenon-133 inhalation method. All patients were studied at least 2 times in a month following the injury. CBF of 63ml/100g/min or more was defined hyperemic. Cerebral hyperemia was observed in 12 patients (36.4%). Age distribution of the cases with hyperemia widely ranged from 26 to 82 years old. Cerebral pathological changes by injuries varied. Mean Glasgow Coma Scale on admission was 9.3 in hyperemic group, and 11.3 in non-hyperemic group. The outcome of 11 patients of 12 (91.7%) with hyperemia was good recovery or moderate disability in Glasgow Outcome Scale, whereas 13 patients of 21 (61.9%) in non-hyperemic group was in good recovery or moderate disability. Hyperemia did not always reflect the level of consciousness or the severity of the injuries observed on CT findings. Cerebral hyperemia developed mainly from 10th to 24th day following the injuries, when 9 of 12 patients (75.0%) with hyperemia had already become fully alert. Cerebral hyperemia is frequently observed in the patients with good recovery.

## 82

REGIONAL CEREBRAL BLOOD FLOW IN THE PATIENTS  
WITH INTRA CEREBRAL MALIGNANT TUMORS EVALUATED  
BY KRYPTON-81m SINGLE PHOTON EMISSION TOMOGRAPHY

Seiichiro Mine\*, Tsuneo Takashima\*, Kanji Sueyoshi\*,  
Nobuharu Yui\*\*, Fujimi Kinoshita\*\*  
Division of Neurosurgery\* and Nuclear Medicine\*\*, Chiba  
Cancer Center Hospital, Chiba,

Using Single Photon Emission Computed Tomography (SPECT) with continuous intra arterial injection of Krypton-81m (Kr-81m) we evaluated regional cerebral blood flow (rCBF) in three dimensions in the patients with malignant brain tumor.

We made the cerebral perfusion image of the patients with high grade astrocytoma and metastatic brain tumor by this method.

Kr-81m in solution was injected into the carotid or vertebral artery by the infusion rate of 29mCi/min. Three dimensional rCBF image was obtained using SPECT system. The rotatory scintillation camera allows stepwise scanning (180 degree in equal 30 steps, 6 degree/30sec), and after a single scanning, transverse slices were reconstructed by a mini-computer.

The cerebral perfusion image obtained by this method showed a constant tendency according to the histological type of the tumor. The rCBF of the tumor region showed localized hyperperfusion in the cases of high grade astrocytoma and showed localized hypoperfusion in the cases of metastatic brain tumor.