were sacrificed at 6, 12, 24 and 48th hours later. The cells in the alveolar spaces were observed with light and transmission electron microscope, and analyzed cytochemically for acid phosphatase. Besides, the process of formation was also observed serially in the semithin and ultrathin sections of App lungs The results showed that these pleomorphic cells contained lysosomes in the cytoplasm which could attribute it into macrophages, and the lysosome granules were confirmed by cytochemistry to showed positive results of acid phosphatase staining. The macrophages started to degenerate by damaging the unit membrane of cytoplasm and organelles, and continued by dilation of rough endoplasmic reticulum to become vacuoles, at last, the cistern of nuclear envelope became bleb and compressed the nucleus to crescent shape. Many crescent nucleus-contained cells piled together to form a whorl-pattern mass, they were PMC. Conclusively, the PMC in App lung were mainly derived from macrophages and some of them were derived from type II pneumocytes.

[Session I] #3

Comparative Brain Pathology of Aged Animals

Hiroyuki Nakayama

Laboratory of Veterinary Pathology, Graduate School of Agricultural and Life Sciences, The University of Tokyo, 1-1-1 Yayoi, Bunkyo-ku, Tokyo 113-8657, Japan

TEL: +81-3-5841-5410, FAX: +81-3-5841-8185

E-mail: anakaya@mail.ecc.u-tokyo.ac.jp

Senile plaques (SP) and amyloid angiopathy seen in the Alzheimer's disease (AD) brain have been found in the brains of aged dogs (more than 9 years old). However, neurofibrillary tangles (NFT), another characteristic lesion in AD, have never been observed in the brains of aged dogs. Neuronal cell loss is an additional histopathological hallmark and apoptotic neuronal cell death was detected in the brains of AD patients. It would be worthwhile to clarify the difference of brain lesions between AD patients and other aged mammalian species including dogs and to discuss the usefulness of aged mammals as models for AD. Therefore, we examined brain pathology in the aged animal brains.

Apoptotic (TUNEL stain-positive) cells were present in both the cortex and white matter of the aged dog brain. Apoptotic neurons were swollen and larger than intact cells, although these changes were slight. Apoptotic bodies or chromatin margination, which are the typical morphological characteristics of apoptosis, were not observed. TUNEL-positive cells in the brain were revealed to be astroglia and oligodendroglia as well as neurons. These observations suggest that a wide variety of brain cells participate in the pathological changes in aged dogs.

The number of TUNEL-positive cells and the number of SP tended to increase with age. On the contrary, the numbers of SP and TUNEL-positive cells showed no correlation. The examination of aged dogs clinically evaluated for dementia before death using the index (dementia index, DI) system, revealed a significant positive correlation

between the number of TUNEL-positive cells and the severity of dementia. However, there was no relationship between the number of SP and DI. The results suggest that the two age-related lesions (apoptosis and SP) could independently occur. Furthermore, brain cell apoptosis rather than SP might be more appropriate histopathological hallmark accounting for canine dementia.

Above mentioned aged-related brain pathology was detected not only in mammalian but also avian species. A variety of SP morphology was observed according to species. SP of dogs and monkeys were divided into 2 types, diffuse(DP) and mature (MP) types as in human. The shape of SP of the cat and camel are very different from that of other species Amyloid angiopathy was detected also in several species. However, NFT which had been reported only in the sheep, bear, cattle and wolverine, was never observed in the species examined in the present study.

The aged mammalian species, in particular dogs, would be useful animal models to elucidate the pathomechanism of Alzheimer's disease.

[Session I] #4

Possible Emerging Infection of EQUINE HERPESVIRUS 9 (EHV-9) in Domestic Animals and Primates

Tokuma Yanai[(1)], Hiroki Sakai[(1)] and Toshiaki Masegi[(1)] and Hideto Fukushi[(2)]

[(1)]Department of Veterinary Pathology, Gifu University 1-1, Yanagido, Gifu, Japan 501-1193 and [(2)]Department of Veterinary Microbiology, Gifu University 1-1, Yanagido, Gifu Japan 501-1193

An outbreak of acute encephalitis occurred in a herd of Thomson's gazelles (*Gazella Thomsoni*) in a Japanese zoo. Seven of 9 gazelles died with or without neurological symptoms in a 3-week period. A herpesvirus was isolated from the brain of the dead gazelles. The virus was neutralized by anti-EHV-1 serum, but its DNA fingerprint differed from those of EHV-1 and other equine herpesviruses. The isolated virus was named equine herpesvirus 9 (EHV-9) based on DNA analysis. Pathologically, all animals examined had nonsuppurative encephalitis characterized by necrosis and degeneration of neurons, gliosis and perivascular cuffing in the cerebrum Five cases had intranuclear inclusion bodies in neurons compatible with herpesvirus. The neuropathology of EHV-9 infection clearly differed from EHV-1-induced encephalitis in the horse, which is characterized by vasculitis, thrombosis, ischemia, and lack of intranuclear inclusions in neurons.

We are conducting experimental studies to clarify the infectivity of EHV-9 in domestic animals and nonhuman primates.

Mice and rats inoculated intnasally showed growth deterioration and neurological symptoms, including depression and seizures, and dies within 8 days of inoculation. The brain of dead animals had severe neuronal degeneration and necrosis accompanied by numerous intranuclear inclusion bodies characteristic of herpesviruses.