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Functional Architecture and Effect of Enucleation of Calcium-binding Protein -immunoreactive Neurons in the Canine Visual System

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To understand the functional organization of calcium-binding proteins, in this study we focused calbindin D28K-immunoreactive (IR) neurons in the superior colliculus (SC) of the dog and studied the distribution and effect of enucleation on the distribution of this protein. We also compared this labeling to that of calretinin and GABA. Calbindin D28K was localized with antibody immunocytochemistry. Calbindin D28K-IR neurons formed three laminar tiers in the SC, one within the lower superficial gray layer (SGL), the second within the upper intermediate gray layers (IGL), and the third within the deep gray layer (DGL). The third tier was not very distinctive when compared with the other two tiers. The distributional pattern of calbinidin D28K was striking different from that of calretinin which forms dense plexus of fibers in the superficial layers. Calbindin D28K-IR neurons in the SC varied dramatically in morphology and size, and included round/oval, vertical fusiform, stellate, pyriform, and horizontal neurons. Neurons with varicose dendrite were also labeled in the IGL. In contrast to calretinin, enucleation appeared to have no effect on the distribution of calbindin D28K-IR neurons in the contralateral SC. Two-color immunofluorescence revealed that a small percentage (11.20%) of calbindin D28K-IR neurons co-localized with GABA. The current results demonstrate that the patterned distribution of calbindin D28K-IR neurons in the superficial SC is not only strikingly different from previously known animals but also different from calretinin. The results also suggest that retinal projection may not control the activity of the expression of calbindin D28K in the dog SC, while the retinal projection control the expression of calretinin. (This work was supported by the Korea Research Foundation Grant funded by the Korean Government(KRF-2006-311-E00370))

Key words: Calbindin D28K, calretinin, enucleation, immunocytochemistry localization, superior colliculus

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Characterization of Avian H3N2 Influenza Virus Infection to Ducks

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Avian influenza viruses are circulating in ducks in Korea, and do not contain polybasic amino acids in the cleavage sites of hemagglutinin protein which indicates highly pathogenic avian influenza virus. In general, it is known that avian influenza viruses do not cause clear clinical signs in ducks. In this study, we wanted to determine whether avian H3N2 influenza viruses isolated from Korean ducks could cause any clinical signs in ducks. When we inoculated 10 ducks with A/DK/Kor/S28/2005(H3N2), infected ducks suffered from clinical signs such as loss of body weight and running nose compared to the uninfected control ducks. The infected ducks showed average weight loss up to 10% and increased body temperature in acute phase of infection during 1 to 4 days p.i. In addition, these ducks have shown reduced egg-laying rate up to 30%. In the histopathological studies, there were histological changes such as interstitial pneumonia, infiltration of inflammatory cells and loss of parabronchi in the lungs, trachea, and rectum of infected ducks. Furthermore, viral antigens were detected in the lung, rectum, ovary and uterus through the immunohistochemistry. The clinical symptoms such as nasal discharge, edema of eye rim and lacrimation in the infected ducks peaked at 7 days p.i. Our study suggests that avian H3N2 influenza viruses could cause economic losses to duck industry.

Key words: Avian influenza, duck