Abstract

Nitric oxide (NO) is a free radical postulated to act as a neurotransmitter, neuromodulator, or second messenger molecule in the central nervous system. Although the neuroanatomical and immunocytochemical characteristics of striatal NOS containing cells have been well studied, few investigations exist describing the changes of the NOS-containing cells in the aged animal. In the previous study, we reported on age-related decrease of NOS-immunoreactive neurons in the cerebral cortex. The aim of this study was to investigate regional discrepancies in changes with aging in the number of NOS-immunoreactive neurons in the basal ganglia which is intimately related with cerebral cortex in function.

In the present study, the number of NOS-IR neurons showed region specific change in the basal ganglia of the aged rat. The number of NOS-IR neurons in the striatum and substantia innominata of the aged rat decreased. In contrast, the number of NOS-IR neurons in the subthalamic nucleus increased. On the other hand, the number of NOS-IR neurons in the nucleus accumbens and olfactory tubercle did not change.

Taken together, important functional changes can be caused by the
region specific changes of the NOS-IR neurons in the basal ganglia with aging. Further multidisciplinary work is needed to ascertain the correlation between the changes in NOS-IR cells in the basal ganglia with aging and the pathogenesis of several neurodegenerative diseases including Parkinson's disease.

**Key words:** Nitric Oxide (NO); Basal ganglia; Aged rat; Immunocytochemistry

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