2. Purpose of present study

Animals use extramaze cues (mainly visual and odor) in performing spatial tasks such as the radial arm maze (Zoladek & Robert, 1978). It has long been dominant that so-called cognitive map (O'Keefe & Nadel, 1978), which is assumed to be internally stored within organisms and helps animals locate themselves regardless of their body position and direction (also called as allocentric localization), mainly contributes to the spatial learning. Possible involvement of other factors such as egocentric localization, which is an ability to localize on the basis of animals' body position and direction, remains to be addressed. Yet, findings that normal animals showed both spatial (allocentric) and response (egocentric) strategies in a probe trial after acquiring T maze task (Thompson et al, 1980) and Morris water maze task (McDonald & White, 1994) strongly indicate that both egocentric and allocentric strategies are essential with regard to spatial localization. It is widely shown that the striatum and hippocampus are selectively involved in egocentric and allocentric localization, respectively. Therefore, it is presumable that both neural systems function simultaneously for efficient performance in spatial localization.

On the other hand, brain cholinergic systems have been studied for quite a long time as one of the major memory processing systems. Physostigmine, metabolite of ACh, impaired the one-way passive avoidance learning (Gammon & Thomas, 1980). Muscarinic receptor antagonist scopolamine impaired the retention of radial arm maze task (Hiraga & Iwasaki, 1984). Cholinergic activities show hypofunction correlating with

retarded performance in learning and memory (Luine & Hearns, 1990). However, most of these findings focused on brain cholinergic systems as a whole and failed to show each cholinergic function that is region specific.

The purpose of the present study was to investigate the differential involvement of the striatal and hippocampal cholinergic systems in spatial localization using 8-arm radial maze and elevated plus maze. The selective lesions of the striatal or hippocampal cholinergic neurons were carried out using intrastriatal or intrahippocampal injections of AF64A, respectively. It is hypothesized that both intrastriatal and intrahippocampal injections would impair radial maze behavior and that EL and AL behavior would be selectively impaired by intrastriatal and intrahippocampal injections of AF64A, respectively.