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The Effects of Intracerebral Injections of a Selective Cholinergic Neurotoxin (AF64A) on Spatial Learning in the Male Rat

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Poster Presentation 23

THE EFFECTS OF INTRACEREBRAL INJECTIONS OF A
SELECTIVE CHOLINERGIC NEUROTOXIN (AF64A) ON SPATIAL
LEARNING IN THE MALE RAT

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Alzheimer's Disease (AD) is essentially caused by a massive degeneration in specific areas of the brain, most notably the hippocampus and cerebral cortex. Another characteristic of AD is the reduced production of the neurotransmitter acetylcholine. This has led to the hypothesis that the cognitive deficits associated with AD are the result of a cholinergic deficiency. One way to test this hypothesis is with the use of specific cholinergic neurotoxins. AF64A, a selective neurotoxin has been used to produce an animal model of AD. In this study, we focused on the effects of intraventricular injections of three different doses of AF64A on Morris water maze performance using a variety of spatial learning tasks in male rats. Our results reveal a dose-dependent effect of AF64A on spatial learning compared to controls. These data provide support for a cholinergic dysfunction associated with AD and further suggest that the use of AF64A, which selectively targets the cholinergic septohippocampal pathway, may provide a viable approach to study the neuropathological mechanisms of AD.