Physiology and Biochemistry

MK-801, a NMDA antagonist, reverses scopolamine-induced behavioral deficits.   *Elizabeth A. Collins\*, Samuel L. Case, Brianna K. Ward, and Ilsun M. White*.  Neuroscience Program, Department of Psychology, Morehead State University, Morehead, KY 40351.

Excessive stimulation of glutamate receptors has been implicated in neural damage and cell death, and it is one of the causes of dementia.  Although such over-excitation can be prevented by direct glutamate antagonists, such as memantine, their therapeutic use in moderate-to-severe Alzheimer’s disease remains controversial. This study further examined the therapeutic effects of NMDA antagonists on memory, using a simple task. Rats were trained on a fixed ratio 20 (FR20), which required 20 lever-presses for each food-pellet reward. MK-801, a NMDA receptor antagonist, was tested in conjunction with scopolamine, a muscarinic receptor antagonist that is commonly used in animal models of Alzheimer’s disease (AD). Drugs’ effects on response latency and task completion were measured under four conditions: saline+saline, saline+MK801, saline+scopolamine, and MK801+scopolamine. Compared to saline-controls, scopolamine impaired behavior by increasing response latency and decreasing lever-presses that earned rewards. MK-801 did not affect performance, but it reversed scopolamine-induced deficits.  Our results provide further evidence that in some cases of AD, blocking NMDA-receptors may avert memory impairment by preventing or decreasing cell death due to over-stimulation of NMDA receptors in the brain.