

Ketamine Increases the Function of γ -Aminobutyric Acid Type A Receptors in Hippocampal and Cortical Neurons

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Reserved. Background: The dissociative general anesthetic ketamine is a well-known

N-methyl-d-aspartate receptor antagonist. However, whether ketamine, at clinically relevant

concentrations, increases the activity of inhibitory γ -aminobutyric acid (GABA) receptor type A

(GABAA) receptors in different brain regions remains controversial. Here, the authors studied the

effects of ketamine on synaptic and extrasynaptic GABAA receptors in hippocampal neurons.

Ketamine modulation of extrasynaptic GABAA receptors in cortical neurons was also examined.

Methods: Whole cell currents were recorded from cultured murine neurons. Current evoked by

exogenous GABA, miniature inhibitory postsynaptic currents, and currents directly activated by

ketamine were studied. Results: Ketamine did not alter the amplitude, frequency, or kinetics of

postsynaptic currents but increased a tonic inhibitory current generated