

?-Adrenoceptor blockade depresses molecular and functional plasticities in the rat neocortex

Flores, Osvaldo

Núñez, Héctor

Pérez, Hernán

Morgan, Carlos

Soto-Moyano, Rubén

Valladares, Luis

Burgos, Héctor

Olivares, Ricardo

Hernández, Alejandro

?-Adrenergic receptor stimulation can significantly facilitate synaptic potentiation in the hippocampus and enhance memory processes, but its effect on neocortical plastic mechanisms is less conclusive. In the present study we determined the effect of propranolol, a ?-adrenoceptor antagonist, on long-term potentiation (LTP) induced in vivo in rat occipital cortex by tetanizing stimulation of corpus callosum and observed a dose-dependent inhibition of LTP. We further administered propranolol through mini-osmotic pumps during 3 days, and observed the performance of rats in a complex operant conditioning learning paradigm and assessed the expression of brain-derived neurotrophic factor (BDNF) in the occipital cortex. Propranolol exposure depressed both the number of reinforced responses in the operant conditioning task and BDNF expression in occipital cortex. Taken together, our results suggest that propranolol impairs memory formation by inhibiting cortical LTP induction and associated B