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Mechanisms of long-term plasticity of hippocampal GABAergic synapses

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Abstract

© 2017, Pleiades Publishing, Ltd.Long-term potentiation and depression of synaptic transmission have been considered as cellular mechanisms of memory in studies conducted in recent decades. These studies were predominantly focused on mechanisms underlying plasticity at excitatory synapses. Nevertheless, normal central nervous system functioning requires maintenance of a balance between inhibition and excitation, suggesting existence of similar modulation of glutamatergic and GABAergic synapses. Here we review the involvement of G-protein-coupled receptors in the generation of long-term changes in synaptic transmission of inhibitory synapses. We considered the role of endocannabinoid and glutamate systems, GABAB and opioid receptors in the induction of long-term potentiation and long-term depression in inhibitory synapses. The preand postsynaptic effects of activation of these receptors are also discussed.

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Keywords

endocannabinoids, G-protein-coupled receptors, GABA receptor B, GABAergic synapses, hippocampus, long-term synaptic plasticity, opioid receptors

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