2-P-141

Poster Sessions

M1 muscarine receptors inhibit GABA release from striatal medium spiny neurons onto cholinergic interneurons.

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Whole-cell patch-clamp recordings were made from striatal cholinergic interneurons (ChINs) in P10-17 mice brain slices with restricted expression of channelrhodopsin-2 (ChR2) in the striatal medium spiny neurons (MSNs). Neurons were voltage clamped at -60 mV. Light stimulation evoked postsynaptic currents in the presence of glutamate and glycine receptor antagonists. These postsynaptic currents were blocked by GABA_A receptor antagonist, bicuculline, suggesting they were GABA_A receptor-mediated inhibitory postsynaptic currents (IPSCs). A muscarine receptor agonist, carbachol (1 μ M), suppressed IPSCs by $49.5 \pm 7.8\%$ (n = 5). To examine the changes in GABA release probability, we calculated coefficient of variation (CV). The CV was not increased after application of bicuculline, suggesting the action site of bicuculline was postsynaptic GABA_A receptors. On the other hand, CV after application of carbachol was significantly increased (p = 0.004). In addition, carbachol (10 μ M) did not affect inward currents evoked by puff-applied GABA (100 μ M). These results suggest that activation of M1 muscarine receptors presynaptically inhibits GABA release from MSNs onto ChINs.