

Functional expression of the $\alpha 7$ and $\alpha 4$ -containing nicotinic acetylcholine receptors on the neonatal rat carotid body

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The carotid bodies (CBs) are chemosensory organs that respond to hypoxemia with transmitter neurosecretion, leading to a respiratory reflex response. It has been proposed that acetylcholine is a key regulator of transmitter release through activation of presynaptic nicotinic acetylcholine receptors (nAChRs). In the present work, we studied the identity of such nAChRs and their contribution to catecholamine release from CBs. Neonatal rat CBs were placed in a recording chamber for electrochemical recordings or disassociated for voltage-clamp studies on isolated cells. Fast nicotine superfusion increases catecholamine release from intact CBs. This response was diminished reversibly by the non-selective nAChR blocker hexamethonium, by the selective $\alpha 7$ blocker α -bungarotoxin and by the $\alpha 4$ -containing nAChR blocker erysodine. In isolated CB cells the nAChR agonists nicotine, acetylcholine and cytisine all evoke inward currents with similar potencies. The nicotine-evoked current was fully bloc