

Dopamine modulates carotid nerve responses induced by acetylcholine on the cat petrosal ganglion in vitro

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We have recently reported that application of acetylcholine (ACh) or nicotine to the petrosal ganglion - the sensory ganglion of the glossopharyngeal nerve - elicits a burst of discharges in the carotid nerve branch, innervating the carotid body and sinus, but not in the glossopharyngeal branch, innervating the tongue and pharynx. Thus, the perikarya of sensory neurons for the carotid bifurcation exhibit selective cholin sensitivity. Since dopamine (DA) modulates carotid nerve chemosensory activity, we searched for the presence of DA sensitivity at the perikarya of these neurons in the cat petrosal ganglion superfused in vitro. Applications of DA in doses of up to 5 mg to the ganglion did not modify the rate of spontaneous discharges in the carotid nerve. However, if DA was applied 30 s before ACh injections, ACh-evoked reactions were modified: low doses of DA enhanced the subsequent responses to ACh, while high doses of DA depressed the responses to ACh. This depressant effect of DA o