

An α_2 receptor agonist and antagonist respectively decreases and increases acetylcholine efflux in the nucleus accumbens of freely moving rats

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The nucleus accumbens (NAc), a major terminal area of mesolimbic dopaminergic system, expresses α_2 -receptors (α_2 -Rs). We have previously shown that local administration of α_2 -R ligands into the NAc failed to alter accumbal extracellular dopamine and noradrenaline levels of freely moving rats (Saigusa T et al., 2012). The NAc contains cholinergic interneurons that might receive inputs from noradrenergic projections (Gonzales KK & Smith Y, 2015) and α -R ligands modulate accumbal cholinergic activity-dependent locomotion of rats (Ikeda H et al., 2007). In the present study, to investigate the involvement of α_2 -Rs in the regulation of accumbal cholinergic neural activity we analysed the effects of the α_2 -R agonist UK 14304 and the α_2 -R antagonist RX 821002 on acetylcholine (ACh) efflux in the NAc of freely moving rats using *in vivo* microdialysis. Drugs were infused directly into NAc through the dialysis membrane. Doses of compounds indicate total amount infused (mol) during 60 min infusions. UK 14304 (300 pmol) reduced accumbal ACh efflux by around 70%. RX 821002 (600 and 6000 nmol) induced a dose-related increase in accumbal ACh efflux by around 175%. These results suggest that accumbal α_2 -Rs may exert inhibitory roles in the control of cholinergic neural activity in the NAc.