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Curcumin potentiates the function of human α7-nicotinic acetylcholine receptors expressed in SH-EP1 cells

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Effects of curcumin, a biologically active ingredient of turmeric, was tested on the Ca2+ transients induced by the activation of α7 subunit of the human nicotinic acetylcholine (α7 nACh) receptor expressed in SH-EP1 cells. Curcumin caused a significant potentiation of choline (1 mM)-induced Ca2+ transients with an EC50 value of 231 nM. The potentiating effect of curcumin was not observed in Ca2+ transients induced by high K+ (60 mM) containing solutions or activation of α4β2 nACh receptors. Notably, the effect of curcumin was not observed when curcumin and choline were co-applied without curcumin pre-incubation. The effect of curcumin on choline-induced Ca2+ transients was not reversed by pre-incubation with inhibitors of protein C, A, and CaM kinases. Metabolites of curcumin such as tetrahydrocurcumin, demethylcurcumin, and didemethylcurcumin also caused potentiation of choline-induced Ca2+ transients. Collectively, our results indicate that curcumin directly potentiate the function of the α7-nACh receptor expressed in SH-EP1 cells.

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