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Authors: Andy Hernández-Abrego, Elizabeth Vázquez-Gómez, Jesús García-Colunga



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Effects of the antidepressant mirtazapine and zinc on nicotinic acetylcholine receptors

Andy Hernández-Abrego, Elizabeth Vázquez-Gómez, Jesús García-Colunga*

Departamento de Neurobiología Celular y Molecular, Instituto de Neurobiología, Universidad Nacional Autónoma de México, Campus Juriquilla, Boulevard Juriquilla 3001, Juriquilla, Querétaro 76230, México.

*Corresponding author: Jesús García-Colunga

Address: Departamento de Neurobiología Celular y Molecular, Instituto de Neurobiología, Universidad Nacional Autónoma de México, Campus Juriquilla, Boulevard Juriquilla 3001, Juriquilla, Querétaro 76230, México.

E-mail address: garciacolunga@unam.mx

Tel. Fax: 52-442-238-1063

Highlights

- The ACh-current mediated by muscle nAChRs was inhibited by mirtazapine.
- Potentiation of ACh-current by zinc was minor in the presence of mirtazapine.
- Mirtazapine inhibited $\alpha 7$ nAChRs in hippocampal CA1 *stratum radiatum* interneurons.
- The inhibitory effects of mirtazapine depended on membrane potential.

Abstract

Nicotinic acetylcholine receptors (nAChRs) and zinc are associated with regulation of mood and related disorders. In addition, several antidepressants inhibit muscle and neuronal nAChRs and zinc potentiates inhibitory actions of them. Moreover, mirtazapine (a noradrenergic, serotonergic and histaminergic antidepressant) inhibits muscarinic AChRs and its effects on nAChRs are unknown. Therefore, we studied the modulation of muscle $\alpha 1\beta 1\gamma\delta$ nAChRs expressed in oocytes and native $\alpha 7$ -containing nAChRs in hippocampal interneurons by mirtazapine and/or zinc, using voltage-clamp techniques. The currents elicited by ACh in oocytes (at -60 mV)

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