In silico, in vitro and *in vivo* studies for analyzing the propranolol action on cholinergic and carbonic anhydrase systems

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Propranolol is a well-known antagonist of adrenergic receptors. In fact, it is classified as a non-selective blocker of beta-adrenergic receptors. However, several other biological activities have been suggested or demonstrated to that molecule. On the other hand, it is known this drug can be active on Central Nervous System (CNS) after oral administration due to its ability to entering trough the blood brain barrier after this pathway. In this work, we tested the activity of propranolol on the cholinergic and carbonic anhydrase systems, which together with the adrenoceptor systems are considered related to potential therapeutic target to CNS-disorders, particularly, those related to cognitive deficit. We approach this topic by *in silico* assays on acetylcholinesterase and carbonic anhydrase showing the ability of this compound to interact on the active sites and potentially exert an effect on these sites. But also, we used these enzymes *in vitro* for observing the capability of this compound to inhibit their action. Finally, we corroborate the improvement of performance in passive avoidance task after its administration in male rats with cognitive deficit induced by orchiectomy. By taking all together, our results suggest the attractiveness to study propranolol as a multi-target drug modulating the cognitive processes for treating CNS disorders.

Speaker Biography

Emily L Castillo-García has completed her training as Biochemistry Engineer in Instituto Tecnológico de Acapulco, Guerrero, Mexico. She is working in Medicinal Chemistry Research and neuroscience projects the last three years. She is particularly interested in the action of some molecules on neurodegenerative disease: steroid hormones, adrenergic agents and enzyme inhibitors. Currently, she is enrolled in Master in Health Sciences program in Escuela Superior de Medicina del Instituto Politécnico Nacional. Her research-advances have been presented in several national and international congresses.

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