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Pre-activation of acetylcholine M3 receptor leads to cannabinoid type 1 receptors regulation: A new cross talk mechanism involving intracellular calcium mobilization in SH-SY5Y human neuroblastoma cells

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Cannabinoids are well known analgesic agents and common drugs of abuse. Both acute and chronic use of these drugs is associated with the development of tolerance and dependence. So far, the mechanism(s) underlying the acute dependence induced by drugs of abuse remain poorly understood and their elucidation is crucial for the understanding of the mechanisms underlying the chronic dependence. Preliminary results, clearly demonstrate that pre-stimulation of the cholinergic system increases levels of intracellular calcium in response to acute stimulation of cannabinoid receptors, thus suggesting a crucial role of the cholinergic system in the regulation of CB1 receptors activity, through the mobilization of intracellular calcium. Moreover, there is ample evidence that increases of intracellular calcium activate a series of transcription factors involved in gene regulation. However, the role played by acetylcholine and by intracellular calcium in the regulation of the CB1 receptor stimulation is largely unexplored. The novel findings presented here demonstrate a new cross talk mechanism between M3 and CB1 receptors that potentially could lead to a new pharmacological approach (development of combination therapies) while maintaining the desired effect (analgesia) could limit the development of dependence induced by the cannabinoid receptor stimulation.

Biography

Pietro Marini has completed his PhD in Pharmacology, Toxicology and Pharmacognosy from La Sapienza University of Rome and Post-doctoral studies from Italian National Reasearch Council. He has published papers and book chapters in reputed journals mostly related to the cannabinoid receptors pharmacology.

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