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Pharmacological characterization of zinc interaction with 5-HT$_7$

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Zinc, as an essential trace element in living organisms, has many functions, including participation in various processes within the central nervous system [1]. The role of zinc in depression and its therapy is emphasized by numerous preclinical and clinical studies, however, the exact mechanism of its action is still not fully understood [3]. Our interests are focused on its effects mediated by serotonin receptors, which are key players in the etiology of anxiety and mood disorders [2].

The main objective of this study was to investigate the effect of zinc on the serotonin receptor 5-HT7 using in vitro methods [4,5]. At first, saturation binding assays were performed in a presence of various zinc concentrations in order to determine whether the shift in radioligand affinity reflects an allosteric mode of action. Two different radioligands (of agonistic and antagonistic activity) have been used, as allosteric regulation is highly sensitive to the type of orthosteric ligand (probe-dependence). Next, kinetic effects on radioligand dissociation rate (Koff) were measured to quantify allosteric effects of zinc ions.

Results of both types of in vitro experiments indicated allosteric mechanisms mediated by zinc during 5-HT7 receptors regulation.

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