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Reduction of adult neurogenesis by temozolomide inhibits intrinsic preference for exploring complex objects in mice

Intrinsic exploratory bias is an innate tendency to prefer certain types of stimuli or environments over others. For example, mice would genuinely spent more time exploring perceptually complex objects (i.e. with edges and concavities) than simpler objects without irregularities. Intrinsic exploratory bias are relevant as they may be associated to cognitive, emotional and even personality-like traits. However, their neurobiological basis are scarcely investigated. Adult hippocampal neurogenesis (AHN) is a key neuroplastic phenomenon for the processing of spatial and contextual stimuli in rodents, being involved in novelty recognition, spatial navigation and spatial pattern separation tasks. Therefore, here we studied whether a pharmacological inhibition of AHN influences intrinsic motivation for exploring complex objects. Twenty male young adult C57BL/6J mice (~3 months old) received vehicle or the DNA alkylating agent temozolomide (TMZ) for four weeks. Bromodeoxyuridine (BrdU) was administered weekly, confirming a reduction of AHN-related markers by TMZ. After the pharmacological treatment, mice were tested for behavior. TMZ did not impair mice's health nor their general exploratory and anxiety-like responses. Unlike control mice, the TMZ-treated mice did not prefer exploring a complex (i.e. irregular) object over a simple (i.e. non-irregular) object of similar size presented at once. Nevertheless, they were able to discriminate a novel complex object from a familiar complex object. This suggest that the lack of intrinsic preference for complexity could be explained by motivational and not by cognitive variables. Future studies should investigate a new role of AHN in modulating exploratory bias. **Project PID2020-114374RB-I00 funded by MCIN/AEI/10.13039/501100011033/. University of Malaga.**