A behavioral test battery only reveals Sex-Specific Differences in Spatial Reference Memory Acquisition in C57BL/6JRj Mice

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Sex disparities in declarative memory have been observed in humans, highlighting a potential advantage in either females or males depending on the specific task. Notably, when it comes to spatial memory, typically, men exhibit greater proficiency. This divergence between sexes has been replicated in male rats, though it remains less evident in mice. In this study, we examined sex-based differences in spatial memory using C57BL/6JRj mice. We conducted various standardized tests (elevated plus maze, open field test, novel object and place tests, forced swimming test and water maze test) but found no discernible disparities between male and female mice in locomotor activity, emotional and behavioral responses, or object and place recognition memory. However, in the water maze task, male mice showed quicker acquisition of spatial information and a preference for spatial strategies during initial training days, though both genders eventually reached similar performance levels in long-term memory consolidation. Furthermore, we examined hippocampal expression of brain-derived neurotrophic factor (BDNF) between male and female mice, suggesting that free-cycling female mice did not exhibit greater variability than males. These findings highlight the importance of considering sex-based differences in animal models and the inclusion of female mice in behavioral research studies. Project PID2020-114374RB-I00 funded by MCIN/AEI/10.13039/501100011033/ and Junta de Andalucía-Consejería de Universidad, Investigación e Innovación—Proyect P21_00777. University of Malaga.