Testing Spatial Memory and Associative Learning in Planaria With Chronic Nicotine Usage

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Nicotine is a psychoactive substance, commonly delivered through e-cigarettes. In the short-term, nicotine can cause an individual to feel enhancements in attentiveness, while also reducing stress or withdrawal symptoms. Withdrawal generally refers to the phase after quitting or reducing the use of a substance; however, in nicotine, these symptoms can be seen as early as the first usage. Unlike most studies that have focused on mammals as the subject, the goal of this study is to investigate how nicotine addiction and withdrawal influences learning and memory through Dugesia dortocephala in T and Y mazes. As the concentration of nicotine increases, it is anticipated that planaria will show decrease in memory retention, seen by slower time trails in the T-maze. Aswell, as planaria are introduced to the Y-maze while experiencing withdrawal, planaria will show longer time trials, suggesting difficulties in learning compared to control. The results of this study indicate that nicotine severely inhibits spatial localization and learning in planaria. Future studies should continue to investigate the effect of nicotine on spatial localization and memory within larger organisms.

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