Investigating the Effects of Straws on Inherited Epigenetics in C. elegans

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Americans use an average of 1.6 straws per day, PFAS, are present in both plastic and paper straws, contributing to the increased health issues related to microplastics and PFAS. Several studies report the harmful effects of PFAS on humans, such as cancers, lipid and insulin dysregulation, decreased immunity, as well as, increased changes in sperm methylation, which can cause development, fertility, and neurological abnormalities. Microplastics have been found to mediate PFAS throughout the body at an increased rate. This project provides methods to determine the effects exposure to paper or plastic straws have on DNA remodeling, specifically behavioral, developmental, and fertility inheritance due to accumulation of mutations. Using C. elegans as a model organism, chemotaxis, brood count, and lifespan assays were completed to determine the effects each straw type has on C. elegans. This study has determined that exposure alters neurological development over generations. Because C. elegans are genetically similar to humans, it could catalyze additional research to determine if the potentially harmful effects of straws on C. elegans also impact humans. It will increase understanding of microplastics and PFAS on inherited epigenetics and potentially determine the alterations that could be passed on. If results are the same in humans, treatment and prevention methods could be developed to reduce the detrimental effects of exposure. It will also help determine PFAS' overall effect on DNA remodeling contributing to the understanding of the link between PFAS, microplastics, and epigenetics .

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