

MACY HILVERS, KAMRYN ARMSTRONG, & SARA SAWYER, Dept of Science and Mathematics and Department of Health Sciences, Glenville State University, Glenville, WV, 26351. The Effects of Microplastics and Acetaminophen on Regeneration in the Planarian *Dugesia*

Planarian flatworms are a good model system to investigate the effects of environmental pollutants on the nervous system because of their unique ability to regenerate its entire body from one segment. Microplastics have become a ubiquitous pollutant, so many questions have emerged regarding the effects of microplastics on public health. Additionally, acetaminophen use during pregnancy has been under scrutiny because of its potential negative effects upon fetal development. The goal of our study is to determine whether either microplastic exposure or acetaminophen exposure has any impact on planarian regeneration, specifically the nervous system. To test our hypotheses, we have been incubating flatworm segments in acetaminophen and microplastic solutions to observe changes in regeneration. We cut the flatworms in half and then tracked their regeneration after being incubated in acetaminophen concentrations of 0.1mM, 0.01mM and microplastic concentrations of 0.1 mg/L. While the acetaminophen flatworms are put into solution immediately after being divided, the worms in the microplastic solution are fed and pre-incubated in the 0.1 mg/L solution to accurately mimic an environmental exposure. We have observed acetaminophen exposure results in premature death compared to controls; we are continuing to work towards finding an acetaminophen solution concentration that has an effect on regeneration without killing the worms. The microplastic solution also has similar effects on regeneration and premature death compared to controls, and we have observed a slowed regeneration time and slowed blastema formation in worms that have survived. Additional work will need to be done to understand how these results can be used to indicate differences in nervous system regeneration. Both the effects acetaminophen and microplastic exposure to human health and development are understudied and must be better understood to avoid potential negative health outcomes.