

The Combinatorial Effects of "Forever Chemicals" on *C. elegans* Development and Behavior

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The chemical class, Per- and Polyfluoroalkyl Substances (PFAS), first used in the 1940s for Scotchgard™ and Teflon™ has grown to be a chemical class of 12,039 variants. Recently, health concerns linking Perfluorooctane Sulfonate (PFOS), and replacement chemical Hexafluoropropylene oxide-dimer acid (GenX) to developmental toxicity have raised concerns about potential risks to the environment and human health. Unregulated manufacturing, commercial use, and disposal of PFOS and GenX have contaminated drinking, surface, and ground waters globally. In *C. elegans*, GenX is linked to developmental toxicity, developmental delays, and body size changes, however, little to none is known about the potential developmental toxicity of GenX in combination with PFOS. In this study, *Caenorhabditis elegans* is used as a model to study developmental defects of a binary mixture. We exposed *C. elegans* to treatments of PFOS and/or GenX at various concentrations. Developmental toxicity was determined by studying the ? Growth and body length with a 95% confidence. We observed a development delay occurring in all treatments. However, especially the mixture sensitivity from L1 - L4 treatment significant reductions in both gradients were shown. At 24 hours, we observed a remarkable sensitivity to show a decrease ? in growth after acute L1 exposure in the lower gradient range. This suggests that a binary mixture of PFOS and GenX has varying effects at a range of concentrations. These results revealed the possibility of synergistic or additive effects caused by mixtures. Therefore, it is essential to understand the defects associated with combinations of the PFAS chemical class.

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