

1167-92-336

Ashley V Schwartz*, avschwartz@sdsu.edu, and **Karilyn E Sant** and **Uduak Z George**.
Mathematical and network models reveal significant developmental deformities induced by the ecotoxicological contaminant Tris(4-chlorophenyl)methanol (TCPMOH) in zebrafish (Danio rerio). Preliminary report.

Any threat for developmental perturbation is a major concern for the risk of later life disease. Tris(4-chlorophenyl)methanol (TCPMOH) is an environmental water contaminant of unknown origin. This study investigates TCPMOH induced deformities during the developmental stage in the zebrafish (*Danio rerio*). We used differential equations, image analyses, curve fittings, network analysis, and laboratory experiments to quantify the implications of TCPMOH exposures. Quantitative and qualitative data was gathered assessing deformities, mortality, nutrient usage, and fish length of each sample at every time point. We developed a novel differential equation model and network model to analyze TCPMOH induced deformities and their relationships. TCPMOH exposed samples experienced an increase in nutrient absorption rates and a decreased growth rate. Spectral decomposition analysis of the network models demonstrate the significant negative perturbation TCPMOH introduced to the developmental process. Repeatedly, we have found TCPMOH to have a statistically significant impact on nutrient availability in the zebrafish. With nutritional perturbation being associated with diseases such as cardiovascular and metabolic, it is of utmost importance to continue the investigation of TCPMOH implications. (Received March 09, 2021)