**Use of *Chironomus* spp. as Sensitive Organisms for Assessing Environmental Quality in the Great Lakes**

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Per- and polyfluoroalkyl substances (PFAS) are widespread emerging contaminants that persist in the environment. Aquatic non-biting midges of the genus *Chironomus* are highly sensitive to PFAS, but the mechanisms driving this enhanced sensitivity are unknown. Another important stressor in the Great Lakes is hypoxia which can lead to decreases in species abundance. Chironomids have a high concentration of hemoglobins (Hb) which helps them survive under a wide range of oxygen levels. Since PFAS have a very high affinity to proteins, they could be affecting the transport of oxygen by Hbs leading to adverse effects, which could help explain their high sensitivity to PFAS. As a first step in assessing the potential impacts of PFAS and hypoxia to Chironomids, we sampled midges from Lake Erie’s central Basin prior to, during, and post-hypoxia and quantified PFAS (> 60 types) in whole bodies, water and sediment. We report bioconcentration factors in midges from Lake Erie for the first time. We will also present transcriptome data from Lake Erie Chironomids collected at different times in relation to hypoxia. Changes in the expression of Hb and other genes will be used as sensitive biomarkers of exposure to PFAS and hypoxia. Our data will provide vital information into the relationship between Hb gene expression and exposure to PFAS and hypoxia, setting the stage for the use of Chironomids as bioindicators of water quality conditions helping inform Great Lakes management decisions.