

Epigenetic changes in *Daphnia magna* induced by microplastics-derived styrene

Polystyrene is one of the most common polymers occurring as microplastics, an emerging type of environmental contaminants in aquatic systems. In our pilot experiments, microscopic fragments of polystyrene were toxic to the cladoceran *Daphnia magna*, a standard species in ecotoxicology. One of the hypotheses explaining this toxicity is that styrene monomers released during plastic fragmentation may induce the lethality via neurological damage or genotoxicity. The hypothesis is based on the existing knowledge on styrene toxicity. In particular, styrene has been found to cause nervous system impairment and reproductive toxicity.¹ It is also classified as a possible carcinogen, and has been indicated to induce epigenetic changes when tested in vitro and in laboratory animals.²⁻³ In this project, we will test the hypothesized mechanism of the polystyrene effects using *Daphnia magna*, polystyrene microplastics and styrene monomers. Specifically, we will examine whether the plastic fragments and styrene monomers can induce neurological damage and epigenetic changes. The output of this project will improve our understanding of the mechanisms of the microplastics effects in the environment.

References

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3. Tabish et al., 2012, Epigenetic Factors in Cancer Risk: Effect of Chemical Carcinogens on Global DNA Methylation Pattern in Human TK6 Cells. PLoS ONE 7(4): e34674

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