

# Toxicity assessment of pollutants sorbed on microplastics using various bioassays on two fish cell lines

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Aquatic ecosystems are subjected to multiple threats including plastics debris. Microplastics, tiny plastic fragments with diameters <5mm, resulted from runoff and weathering breakdown of larger plastics debris, represent an emerging concern for marine ecosystems. Cosmetic, chemical industry and domestic use including the wastewater of washing machines are additional sources of pollution and accumulation of microplastics particles in aquatic environment. Microplastics impacts on aquatic life are little studied. These small particles could be ingested directly by organisms and cause chronic physical and toxicological effects. Moreover, microplastics are the support for a lot of chemicals present in aquatic environment, especially hydrophobic substances. The REACH Regulation and the European directive on the protection of animals used for scientific purposes wish the establishment of alternative to animal experiments. In this concern, toxicological assays on fish cell lines are being developed as alternative methods to provide fast and reliable results on the toxic and ecotoxic properties of chemicals or mixtures. In this aims, rainbow trout liver cell line RTLW-1 and Japanese medaka embryos cell line OLCAB-e3 were used to evaluate toxic effect of water and organic extracts of microplastics artificially coated with B[a]P and PCB 126 to validate different assays e.g. MTT, EROD and comet assay. In addition, these bioassays were used on both cell lines to analyze the effects of different microplastics samples from Bermuda's and Hawaii's beaches. No toxicity was observed for virgin microplastics whatever the cell line and the bioassay used. Cell lines exposed to microplastics organic extracts from artificially coated particles showed EROD and DNA damage induction in a similar manner as cell lines exposed to the chemical alone (Figure 1A). For environmental microplastics, low or no cytotoxicity was observed on both cell lines. However, EROD activity was induced (Figure 1B) and genotoxicity was observed for certain organic extracts. Difference of sensitivity was observed between both cell lines. Preliminary results obtained here support that cell lines could be an interesting tool to evaluate the potential chemical toxicity of microplastics if chemicals are bioavailable and released in organism.

**Keywords:** Fish cell line, Microplastics, Sorbed pollutants, EROD activity, Genotoxic and cytotoxic effects