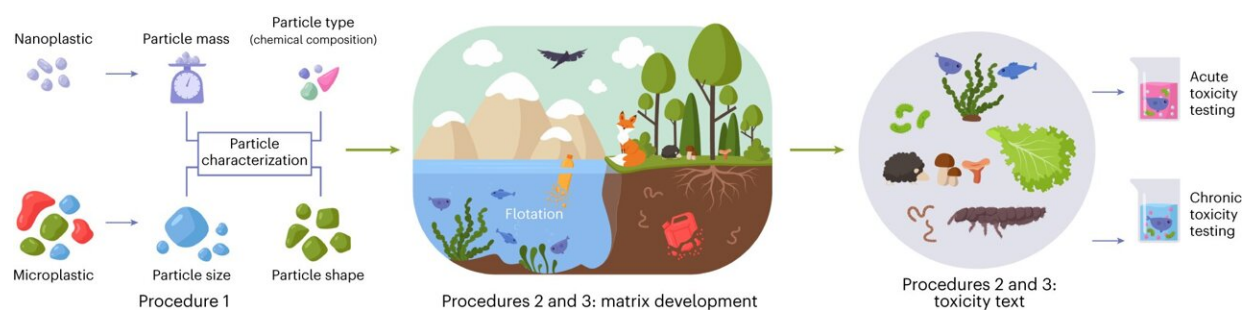


Researchers publish first harmonized exposure protocol for ecotoxicity testing of micro- and nano-plastics

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An overview of the procedures. Our protocol contains three procedures. Procedure 1 consists of the production of MNPs by using a top-down approach followed by characterization of the MNPs (determining particle mass (the concentration of the MNPs), particle type (the type of polymers forming the MNPs), particle size and shape). Procedures 2 and 3 consist of two sections: (i) developing exposure matrices for soil (Procedure 2) and water (Procedure 3) and (ii) performing the toxicity test with different organisms. For developing the exposure matrices, monitoring particle behavior (e.g., (hetero)aggregation and sedimentation) is required to minimize the loss of the particles. The toxicity tests can be performed by using different organisms and the modified OECD guidelines available for ecotoxicity testing of chemicals. The toxicity assessment might be short term or long term, generating acute and chronic toxicity data. It is important to investigate changes in the properties of the particles over time and to monitor the actual exposure concentration. Credit: *Nature Protocols* (2023). <https://doi.org/10.1038/s41596-023-00886-9>

Plastic pollution has become a significant environmental and human health issue at a global scale. Yet despite increasing concern over the harmful effects of micro- and nano-plastics (MNPs), no harmonized guidelines or protocols for their ecotoxicity testing have been available to date.

Current ecotoxicity studies often use commercial spherical particles as models for MNPs, but in nature, MNPs occur in variable shapes, sizes and chemical compositions. Moreover, [protocols](#) developed for chemicals that dissolve or form stable dispersions are currently used for assessing the ecotoxicity of MNPs, but these protocols are not optimal for studying MNPs, as [plastic particles](#) do not dissolve and also show dynamic behavior in the exposure medium, depending on, for example, MNP physicochemical properties and the medium's ionic strength.

A new exposure protocol, published in *Nature Protocols*, considers the particle-specific properties of MNPs and their dynamic behavior in exposure systems. The protocol enables the production of more realistic MNPs that resemble those occurring in nature. The protocol also describes exposure system development for short- and long-term toxicity tests for soil and water organisms.

The researchers provide examples of using the protocol to test, for example, MNP toxicity in marine rotifers, [freshwater mussels](#), daphnids and earthworms. The present protocol takes between 24 hours and two months, depending on the test of interest, and can be applied by students, academics, environmental risk assessors and industries.

More information: Fazel Abdolahpur Monikh et al, Exposure protocol for ecotoxicity testing of microplastics and nanoplastics, *Nature Protocols* (2023). [DOI: 10.1038/s41596-023-00886-9](https://doi.org/10.1038/s41596-023-00886-9)

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