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Understanding the health risks of exposure to micro- & nano-plastics

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Micro- & nano-plastics (MNPLs) are considered emergent pollutants widely spread over all environmental compartments. They are mostly generated from the degradation of the huge amounts of plastic waste that can be found in the environment. There is evidence that humans can internalize these MNPLs through inhalation and ingestion and that the small size of the plastic particles may allow for absorption and systemic biodistribution. This exposure scenario is aggravated by the fact that MNPLs are thought to have the potential to act as vectors for other well-known harmful contaminants. Nevertheless, and despite of the fact that MNPLs research is a very fast-moving field, information on the biological impacts of MNPLs in mammalian models remain unclear, and the limitations in current methodologies do not allow for accurate MNPLs exposure and hazard evaluation. More solid evidence is therefore needed to enable science-based risk assessment of MNPLs that can be utilized to protect human health and ecosystems from its derived adverse effects.

In this context, the present talk will focus in presenting the current science on MNPLs research, the key knowledge gaps in this area, and the approaches developed and results obtained in the frame of the large-scale EU Project PlasticHeal (www.plasticheal.eu/en), aimed at developing front-end tools to study the impact and mode of action of MNPLs, to benefit the identification and management of safety issues arising from MNPLs human exposure. These include advances in the areas of MNPs sampling and monitoring, human exposure and fate, MNPs-induced effects, and MNPs risk evaluation. Special attention will be given to complex in vitro systems, new approach methodologies, MNPLs-induced long-term effects, and genotoxicity.

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