



How micro- and nanoplastics in the environment might impact our health and immune system

This EU-funded project aims to advance the science and our understanding of how micro- and nanoplastic particles (MNPs) in our environment might impact human health, particularly in relation to the immune system. We bring together 15 partners from 7 countries and work with Europe's top laboratories and risk assessors to measure plastic particles and in particular, their immuno-toxicological effects on the human body.

POLYRISK is a member of **CUSP** – the European research cluster to understand the health impacts of micro- and nanoplastics (MNPs), composed of 75 organisations from 21 countries.

Why do micro- and nanoplastic particles (MNPs) matter?



We are exposed to MNPs on a daily basis. They may be used or end up in a range of consumer products, including personal care products and cleaning supplies.



MNPs can be found everywhere in our environment, from artificial turf with rubber granulate infill, synthetic rubber tires and even our clothes.



After entering our bodies, MNPs directly contact and affect cells. They have already been found in human lungs and in faeces, confirming human exposure.

While evidence of the existence of microplastics within our bodies exists, we currently do not know how they affect human health. Human health risk assessment protocols specific to MNPs are not available and key data on toxicity and exposure is missing. This hampers science-based decision making.

Polyrisk examines occupational and consumer exposure to microplastics to better understand their potential adverse effects on the immune system

We are doing so by examining external and internal exposure to microplastics in humans in five real-life scenarios. This will be a critical component to perform risk assessment.



Exposure to traffic-related pollution in pedestrians



Exposure to MNPs from bottled water ingestion



Exposure to MNPs from soccer fields with artificial turf with rubber granulate infill



Occupational exposure in the textile industry



Occupational exposure in the rubber tire refurbishing industry

Polyrisk aims to:

- ➕ Reduce current MNP risk uncertainties and support EU efforts to ensure public health is adequately protected from the potential risks of MNP pollution.
- ➕ Feed evidence into existing and future EU policies and support actions under the European Green Deal to reduce plastic pollution, such as the planned EU restriction on intentionally-added microplastics.
- ➕ Contribute to the scientific exchange on microplastics related to policies and reforms in the European Union.

Specific objectives

- Develop and apply innovative sampling, sample preparation and analytical methods to assess exposure to microplastics. This includes the detection, quantification and characterisation of different sizes of plastic particles.
- Develop and apply a human-based in vitro toolbox of methods for testing epithelial transfer of particles and immunotoxicity of MNP. This is needed to assess concentration-effect relationships.
- Study effects on peripheral blood lymphocytes to link exposure to immune alterations.
- Assess actual exposure and biological effects of MNPs in real-life scenarios.
- Manage data for current use to develop MNP risk assessment strategy.
- Develop an effective human risk assessment strategy.
- Exchange and communicate findings with relevant stakeholders.



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