

Hazards assessment of micro- and nanoplastics and associated additives/contaminants to human health

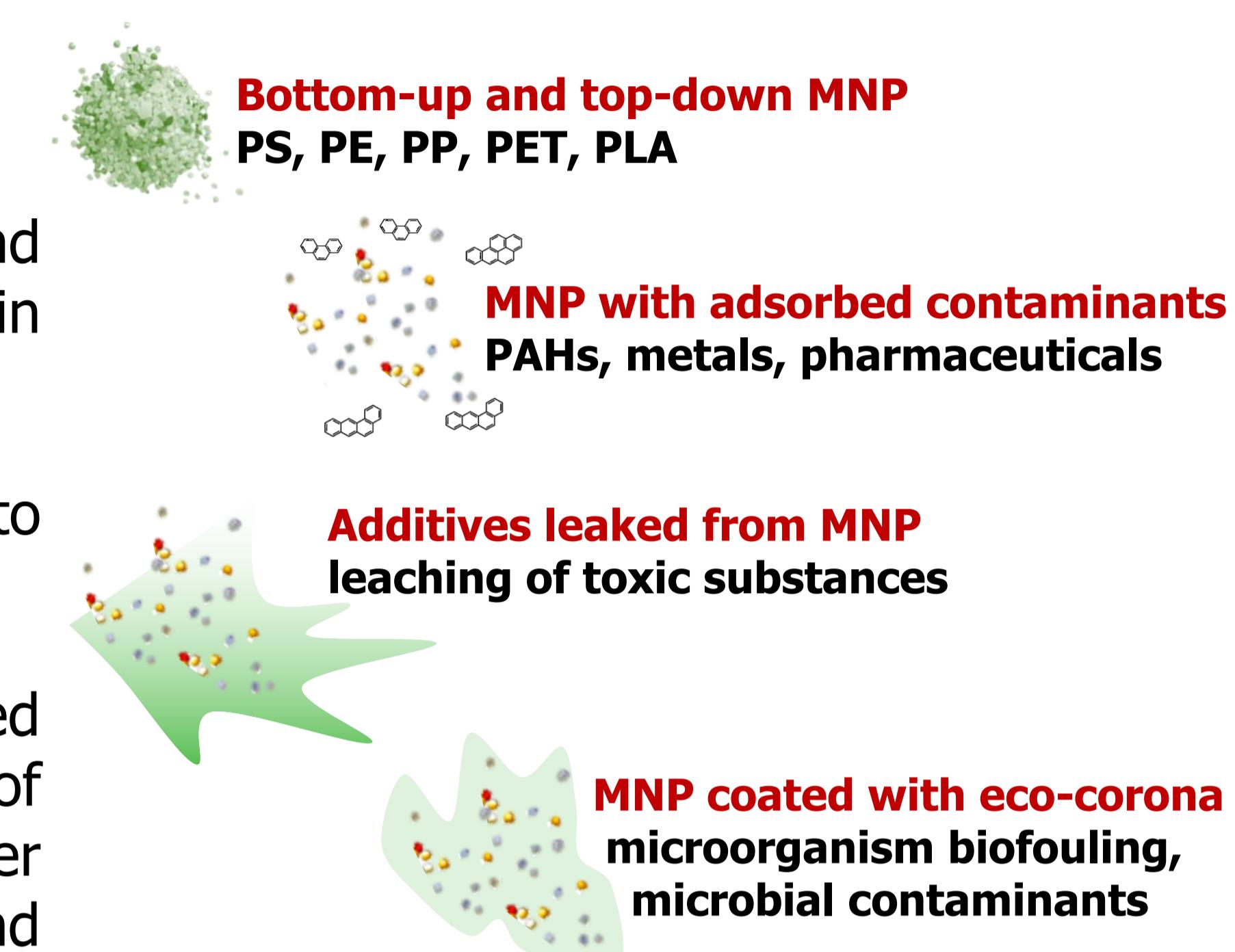
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Our objectives

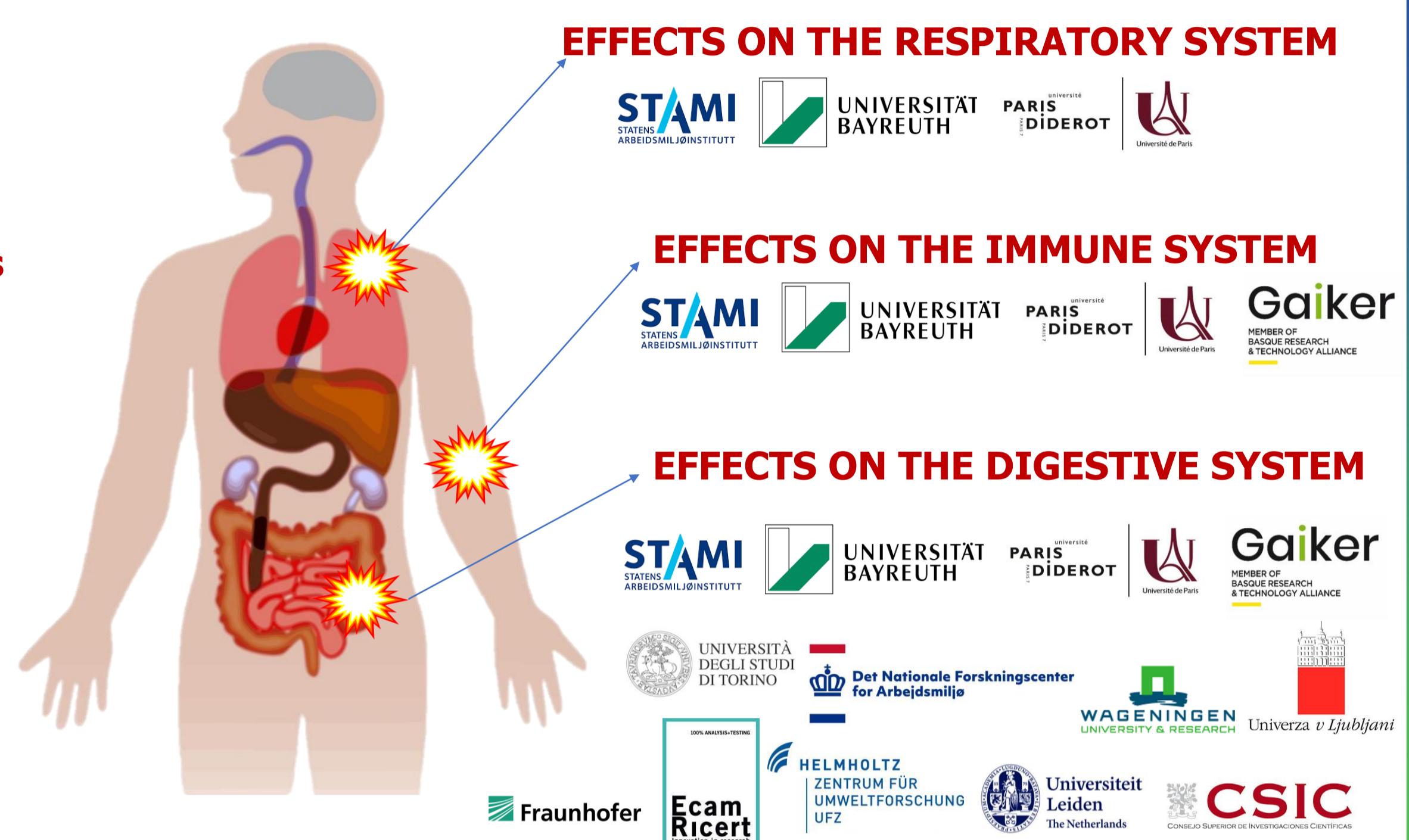
Our major goals are:

1. Assess acute and chronic effects of micro- and nanoplastics (MNP) exposure through main routes: ingestion and inhalation.
2. Adapt and apply *in vitro* and *in vivo* methods to assess MNP toxicity.
3. Contribute to the development of Integrated Approaches for Testing and Assessment (IATA) of MNP toxicity (see also the PlasticsFatE poster "Novel approaches to risk assessment and decision support" by Ballesteros Riaza et al.)

Test materials:



Target systems:



Our strategy

In vitro

Lung

- Alveolar epithelial cells (A549)
- Bronchial epithelial cells (Calu-3, BEN, primary cultures)

Immune

- Peripheral blood mononuclear cells (PMBC)
- Monocytes (THP-1, dTHP-1)
- Neutrophils (dHL-60)

Gastrointestinal

- Oral squamous (HN)
- Colorectal (Caco-2)
- Gastric (MKN-45)
- Colorectal (HT29-MTX)
- Liver (HEP-G2)

Realistic model

monocultures

Time

Lung

- Epithelial cells/ macrophages (A549/dTHP1)
- Epithelial cells/ endothelial cells (A549/EA-hy926)
- Epithelial cells/ Neutrophils (A549/dHL-60)
- Epithelial cells/ fibroblasts (Calu-3/WI38)

Gastrointestinal

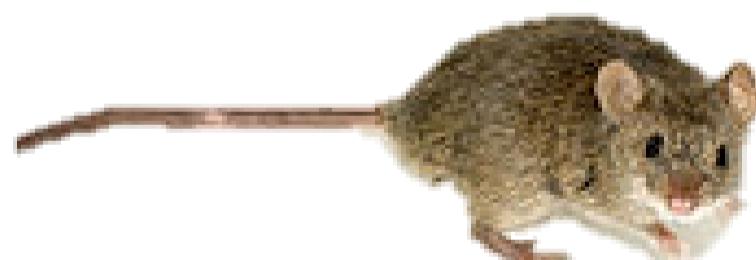
- Macrophages/epithelial cells (THP-1/Caco-2)
- Dendritic cells/epithelial cells (Caco-2/MUTZ3)
- Epithelial cells (Caco-2/HT29 (MTX))

Toxicity/uptake and translocation under dynamic flow conditions

Microfluidics

3D models

In vivo



Effects and fate in lungs and gastrointestinal tract in mice (lung microbiome) (additives and/or contaminants)

Expected outcomes

- A complete toxicological profile of a set of relevant MNP and associated additives/adsorbed contaminants (A/C) in the respiratory and gastrointestinal tract.
- Adapted and validated new methods to assess MNP toxicity both *in vitro* and *in vivo*.
- Generation of findable, accessible, interoperable and reusable (FAIR) data to support the risk assessment of MNP.

Coordination and Management

- Scientific coordination:
- Project coordination:
- Project management:
- Dissemination management:

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