

Nanoplastics: An Under-Measured Major Component of Plastic Exposure

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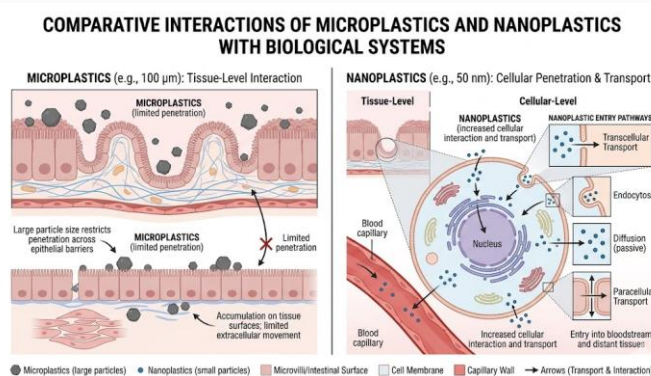


Nanoplastics Are Under-Measured

- Most environmental detection methods are optimized for microplastics (μm scale)
- Nanoplastics ($<1 \mu\text{m}$) are difficult to isolate, visualize, and quantify
- Earlier studies often excluded nanoplastics, underestimating total particle counts
- Recent studies suggest total particle concentrations may be 10–100 \times higher when nanoplastics are included

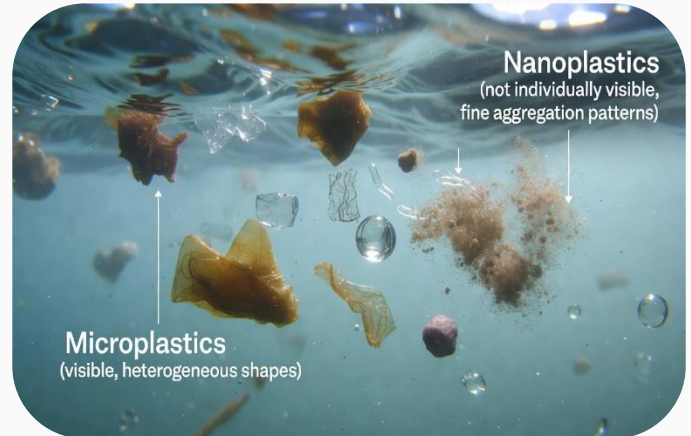
Nanoplastics Are Detected in Human Systems

- Identified in blood, lungs, placenta, arterial plaques, and other tissues
- Exposure occurs through ingestion (water, food) and inhalation
- Smaller particle size increases mobility and potential for systemic distribution



Why This Matters

- Under-measurement of nanoplastics may lead to incomplete exposure assessment
- Current monitoring approaches may underestimate total plastic burden
- Improved detection is needed to better understand environmental and human health impacts



Nanoplastics Are Widespread in the Environment

- Detected in drinking water, bottled water, oceans, air, soil, and food systems
- Recent studies show millions of particles per liter in treated drinking water
- Bottled water often contains higher nanoplastic concentrations than tap water
- Nanoplastics frequently represent a substantial fraction (>50%–90%) of total particle counts

Potential Biological Relevance of Nanoplastics

- Smaller particles may interact more readily with cells and biological barriers
- Associated with oxidative stress, inflammation, and cellular responses in experimental models
- Emerging evidence suggests possible links to cardiovascular, neurological, and metabolic conditions
- Human data are still evolving; many findings are based on biomonitoring and mechanistic studies