

"Instant Microplastics", are there concerns about construction dust?

Rutgers Center for Environmental Exposure and Disease (CEED)

Pilot Award

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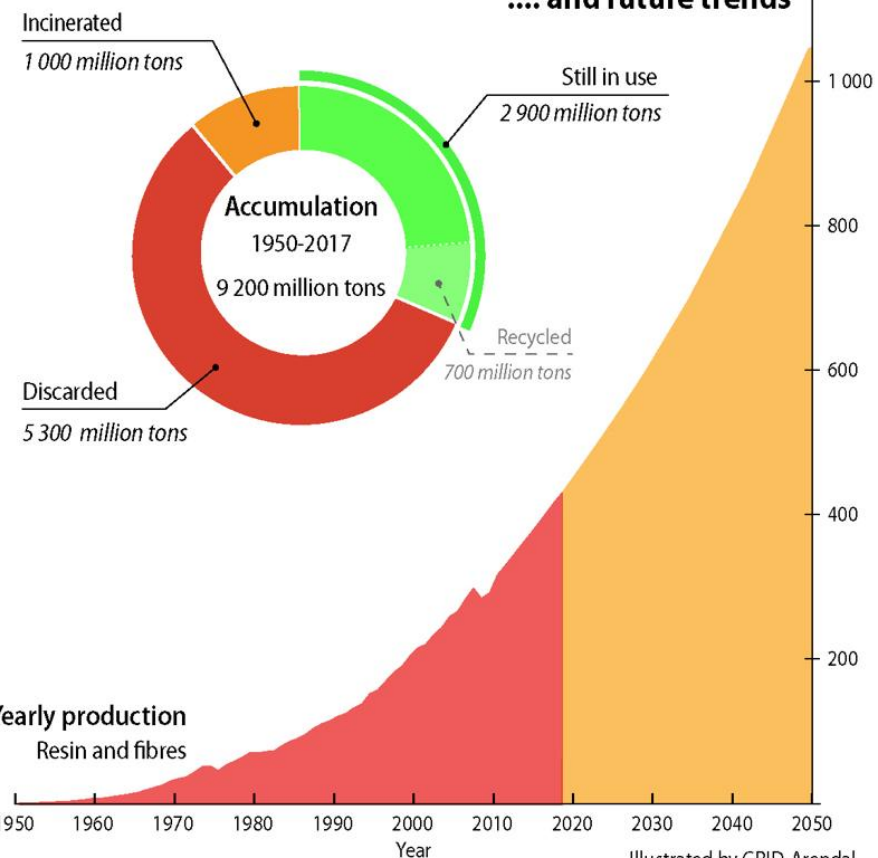
**Center for Environmental
Exposures and Disease**

Background – Plastics



Global plastic production and accumulation

.... and future trends



Illustrated by GRID-Arendal
UNEP (2021). From Pollution to Solution: A global assessment of marine litter and plastic pollution. Nairobi.

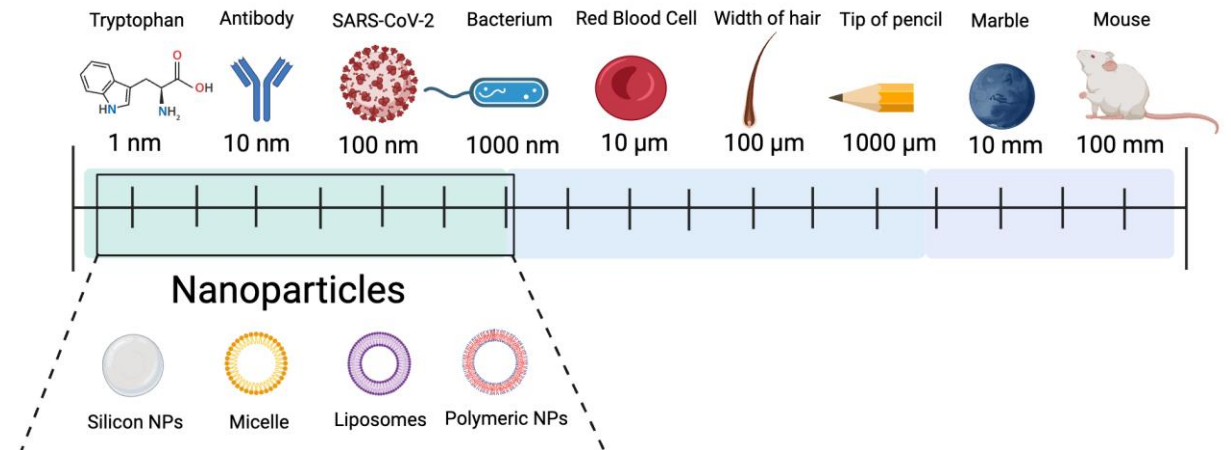
Background – Micro- and Nanoplastics - Definition

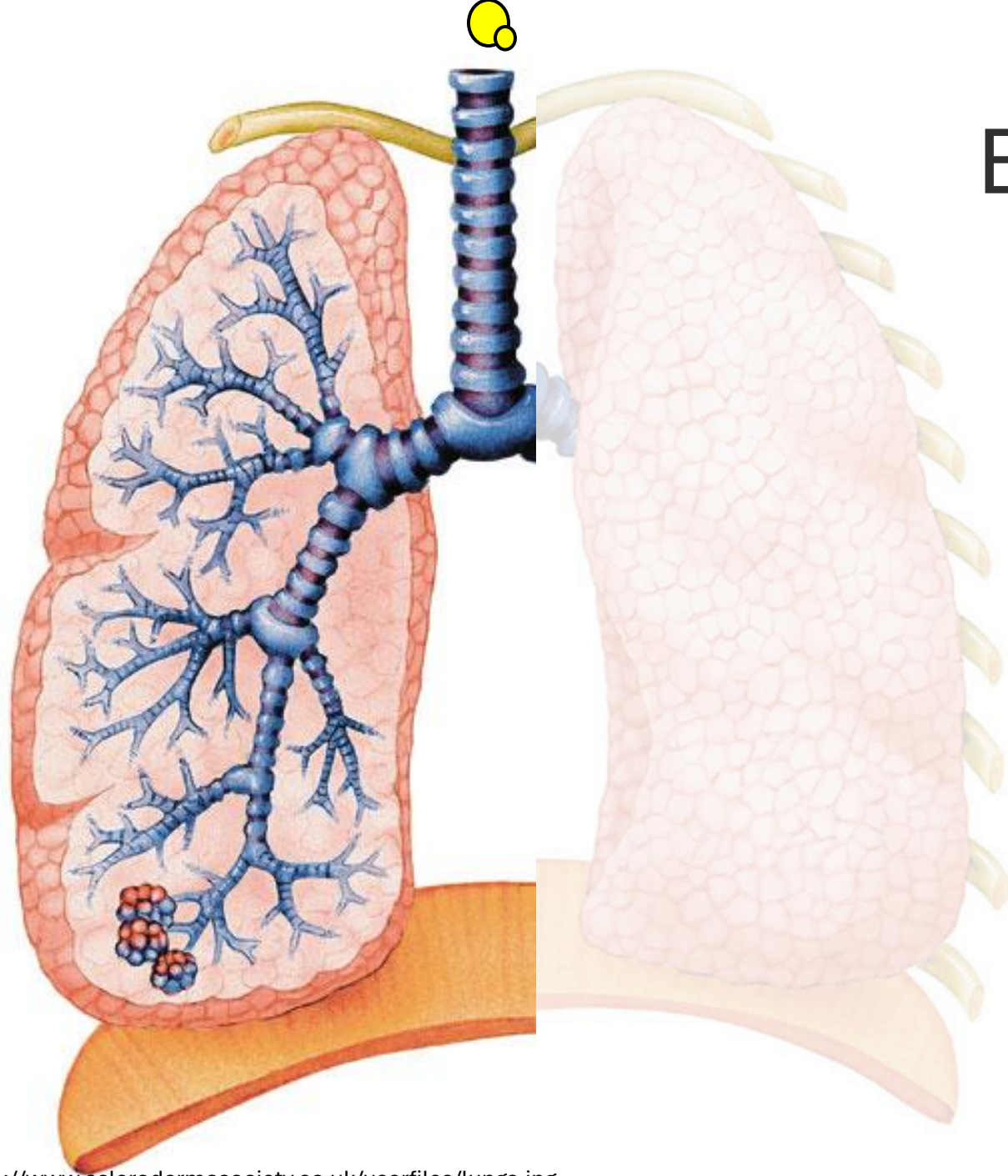
1. Plastic particles (any kind of plastic)
2. Definition based on size

Microplastics (< 5 mm)



Nanoplastics (<100 nm)



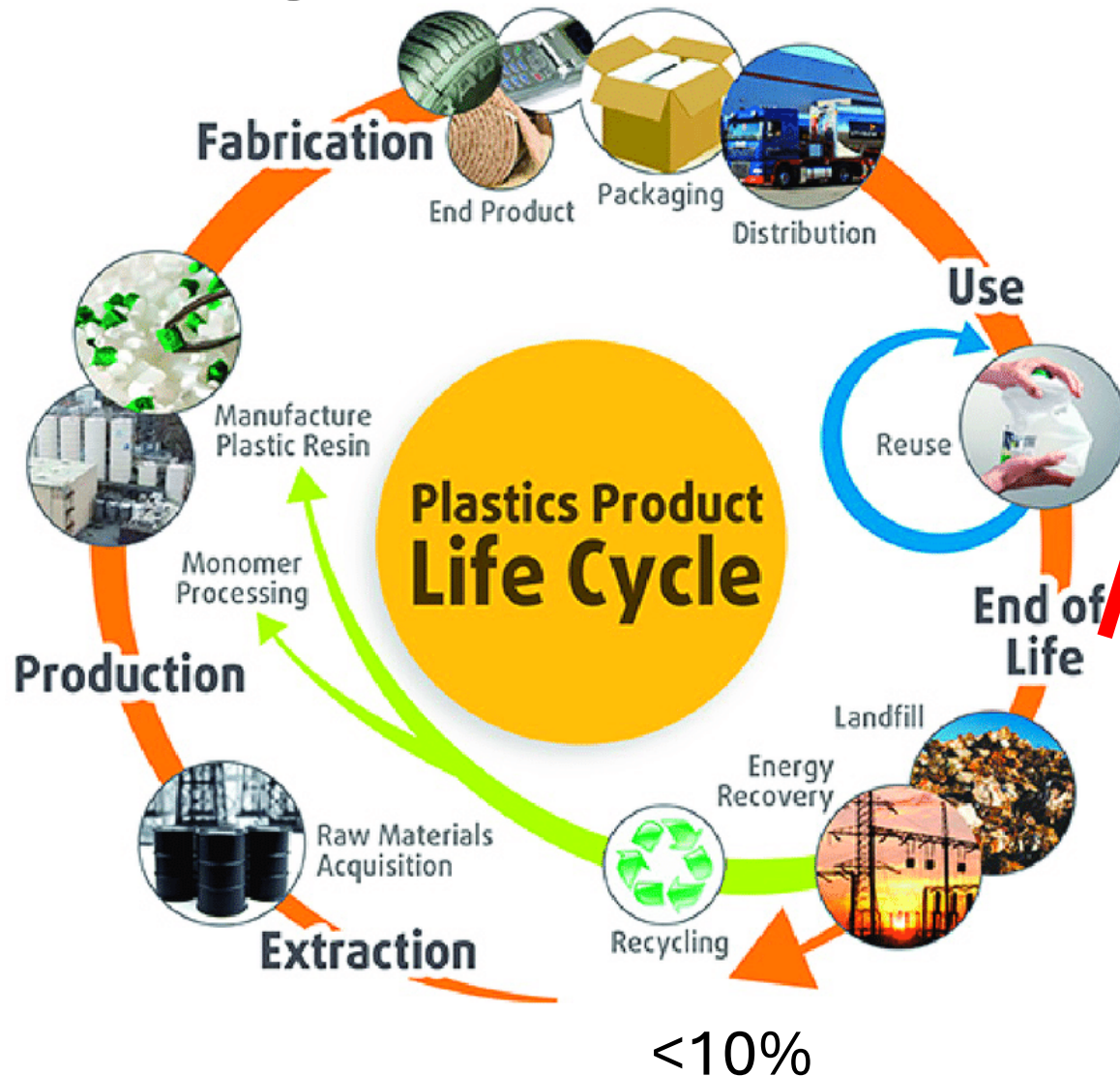


Background – Size Matters

Nanosized particles can reach deeper into the lung.

These smaller particles have been shown to have a greater toxicity than microparticles of the same chemical composition.

Background – Where Do They Come From?



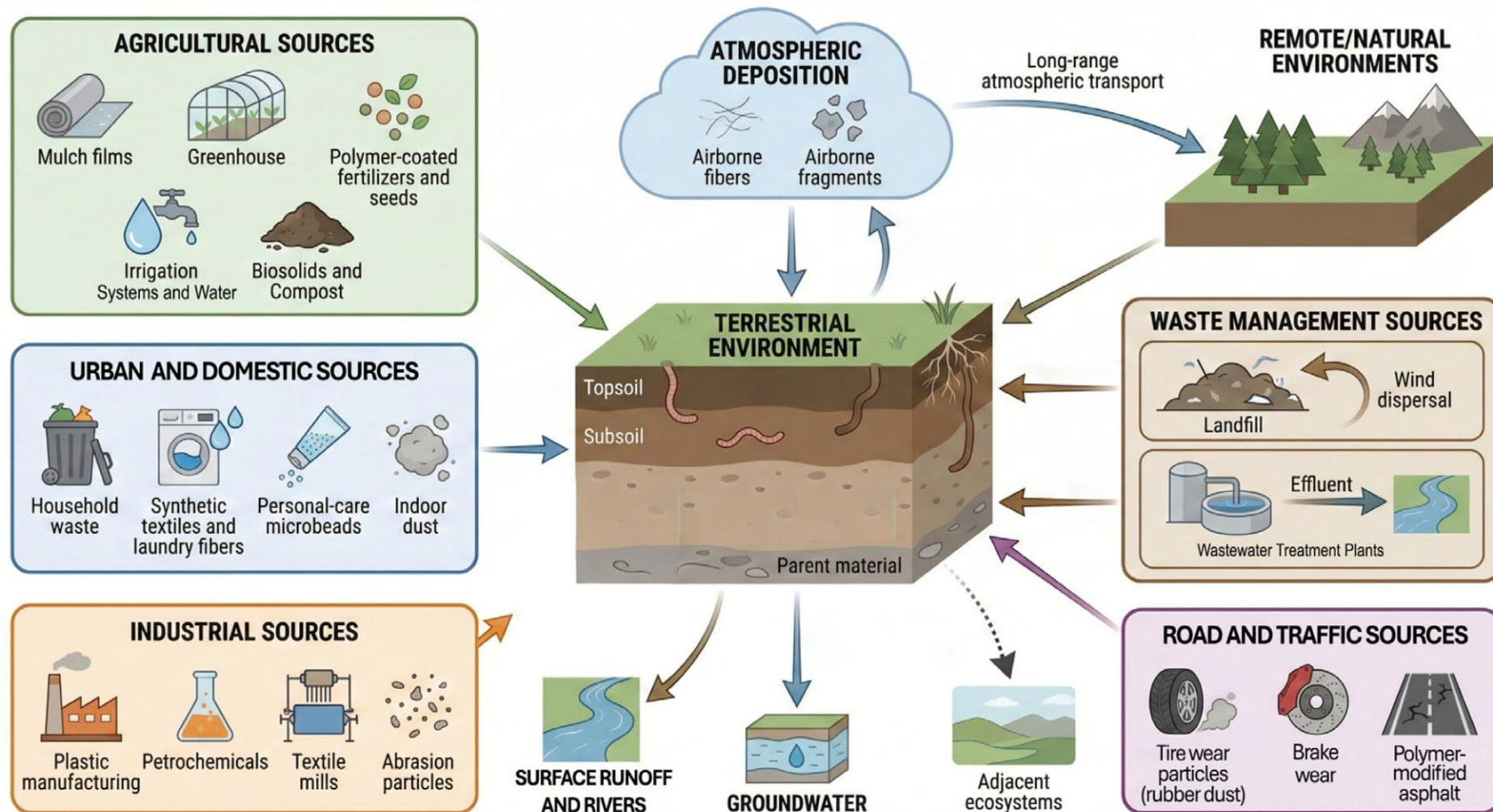
Breakdown of plastics ranges from 10 – 1000 years. Thermal/UV/mechanical degradation.

The average estimate for plastic bag degradation is 20 years, while a plastic bottle to breakdown is 450 years.

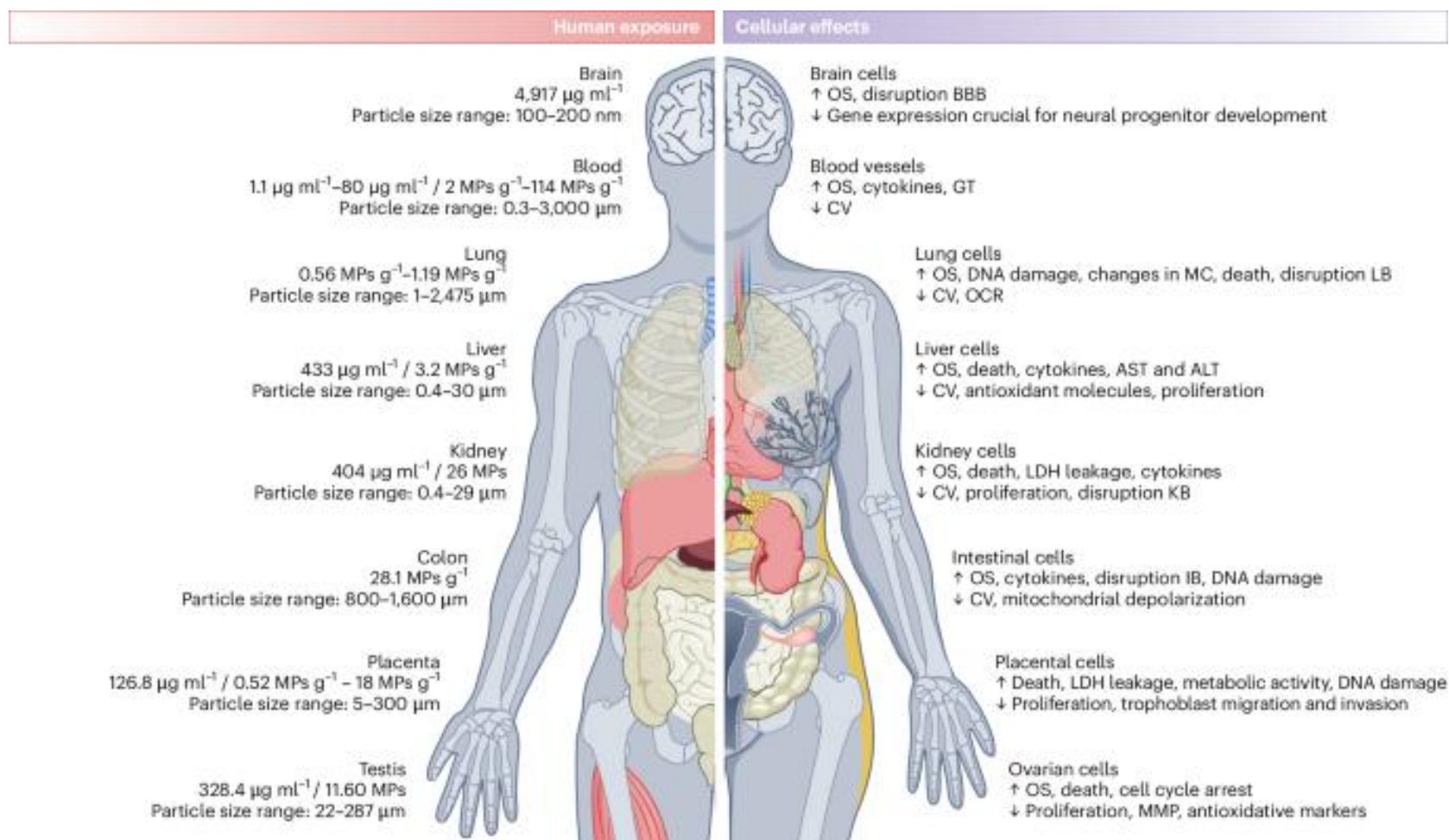
Unfortunately, this concept of decomposition is unclear.

- Not always referring to chemical degradation.
- May refer to particle size.

Background – Where Do They Go? - Environmental



Background – Where Do They Go? - Human



Rutgers – EOHSI/CEED – Pilot Project



- Founded in 1987
- Center is supported by a grant from NIEHS.
- Mission: to understand how environmental and social exposures integrate to impact human health and influence diseases
- Competitive pilot funds available for basic science and joint community-scientist partnerships.

Rutgers – EOHHSI/CEED – Pilot Project

Our study has focused on the unintentional production of MNP during building and construction, instantly released to the environment.

The dust from wood is “saw dust”, what do you call the particles from plastic/ manufactured materials?



Experimental Design

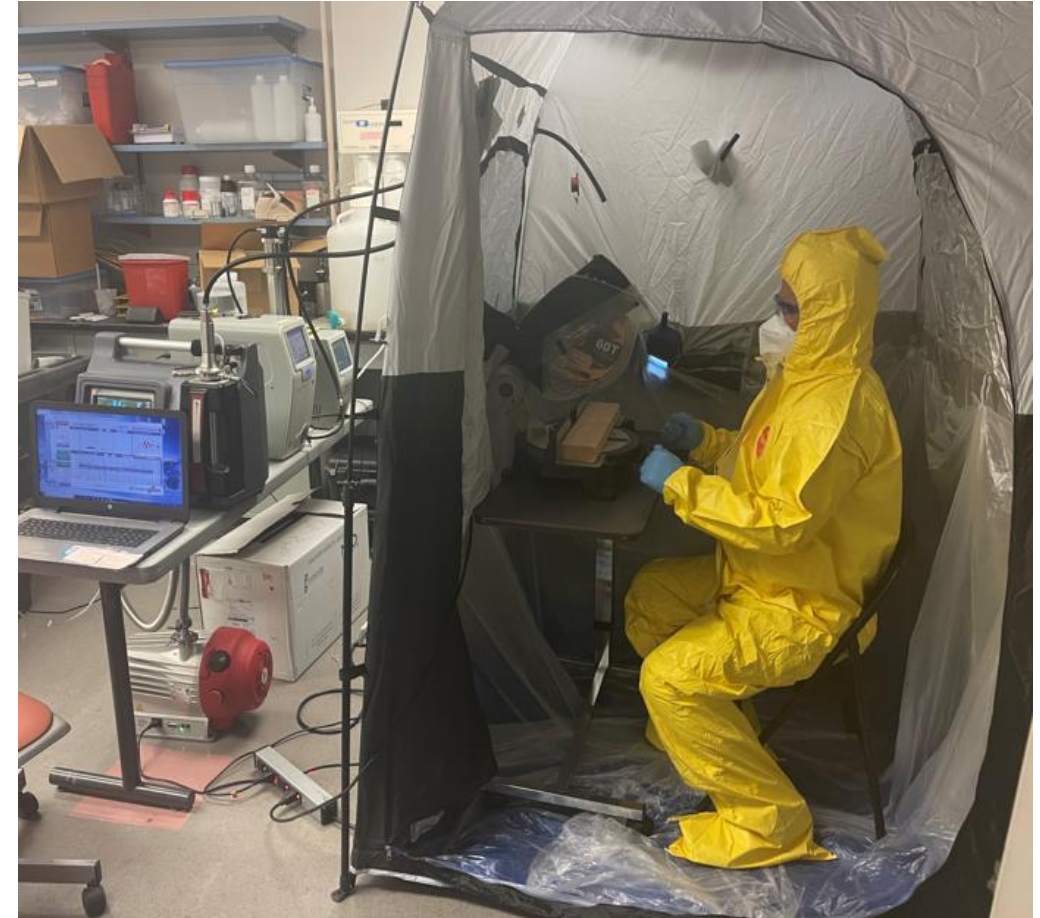
- Black and Decker miter saw
 - With and without capture filter bag
- New 60T blade
- Materials:
 - Composite Decking
 - PVC pipe
 - PVC trim
 - Vinyl siding
 - 2x4 lumber



Experimental Design

Sample Collection

- Single Technician
- Marked PPE suit
- Enclosed Space for cutting/collection
- Collect for 2m prior and 30 after single cut
- Collect particles from saw, collection bag, and area around technician for analyses
- Monitoring Equipment:
 - PM 2.5 capture
 - Microparticle count
 - Nanoparticle count
 - Microparticle capture for chemical analyses



Preliminary Results – EACH CUT

Sheet # + Bag	Total collected mass from one cut (g)
1 – Manuf. Lumber	8.469
3 - Vinyl Siding	3.859
5 – PVC pipe	4.473
7 – PVC Trim	4.862
9 – Wood	4.379

Particle Sizes Data

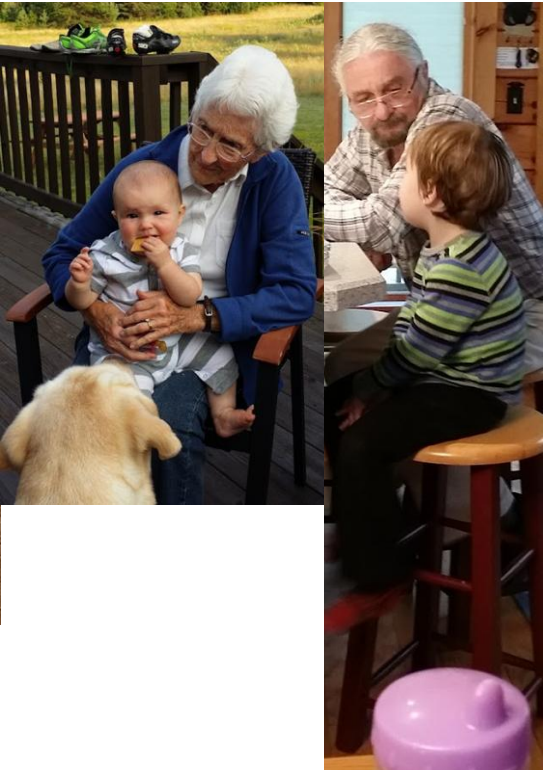
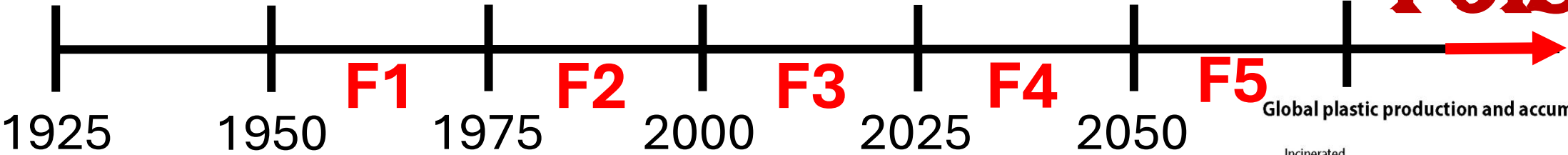


*Under analysis, review, repetition

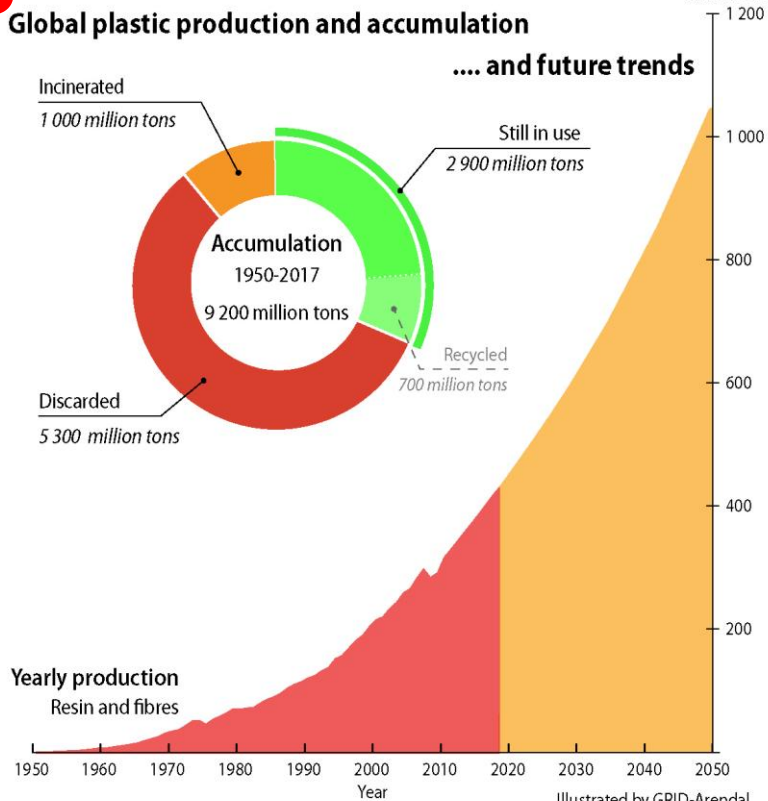
We are confident to state that there are billions of micro- and nanoparticles produced with each cut of material.

Why Don't We Know The Health Effects Yet??

Domestic
Plastic Use



THE DOSE MAKES THE POISON



UNEP (2021). From Pollution to Solution: A global assessment of marine litter and plastic pollution. Nairobi.

What Can We/You Do?

- Plastic Exposure is Nearly Impossible to Unsee
- Personal Awareness, Decision Making
- Asking - Do We Need?
- **Municipalities – Local Awareness**
 - Local Ordinances (CuttheDust.Org)
- State Legislation – “Skip The Stuff”
 - Others in Discussion
- **Join "People Over Plastics" Coalition by emailing BeyondPlasticsNJ@gmail.com**
 - Contact nchecko@anjec.org for more information
- **Push for Producer Responsibility**





Thank you, Acknowledgements, Questions?

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