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## Settled dust in preschools: characterization and genotoxicity of trace metals and polycyclic aromatic hydrocarbons

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# SETTLED DUST IN PRESCHOOLS:

## CHARACTERIZATION AND GENOTOXICITY OF TRACE METALS AND POLYCYCLIC AROMATIC HYDROCARBONS



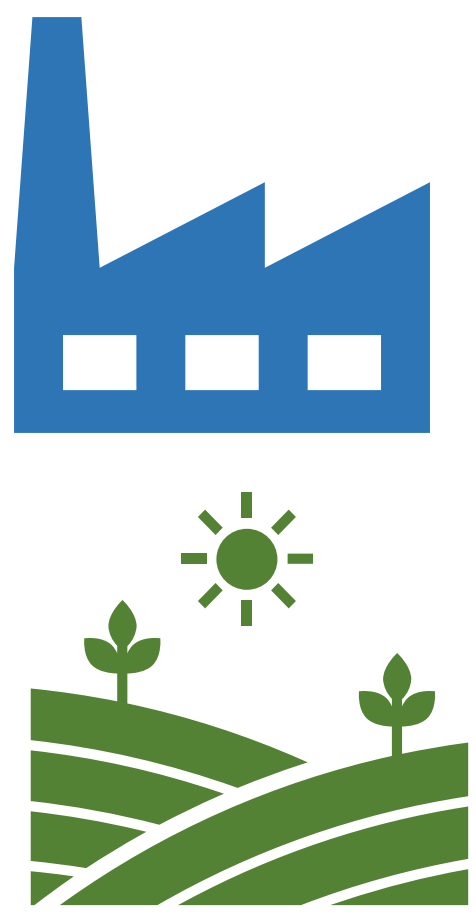
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### CONTEXT

### HYPOTHESIS

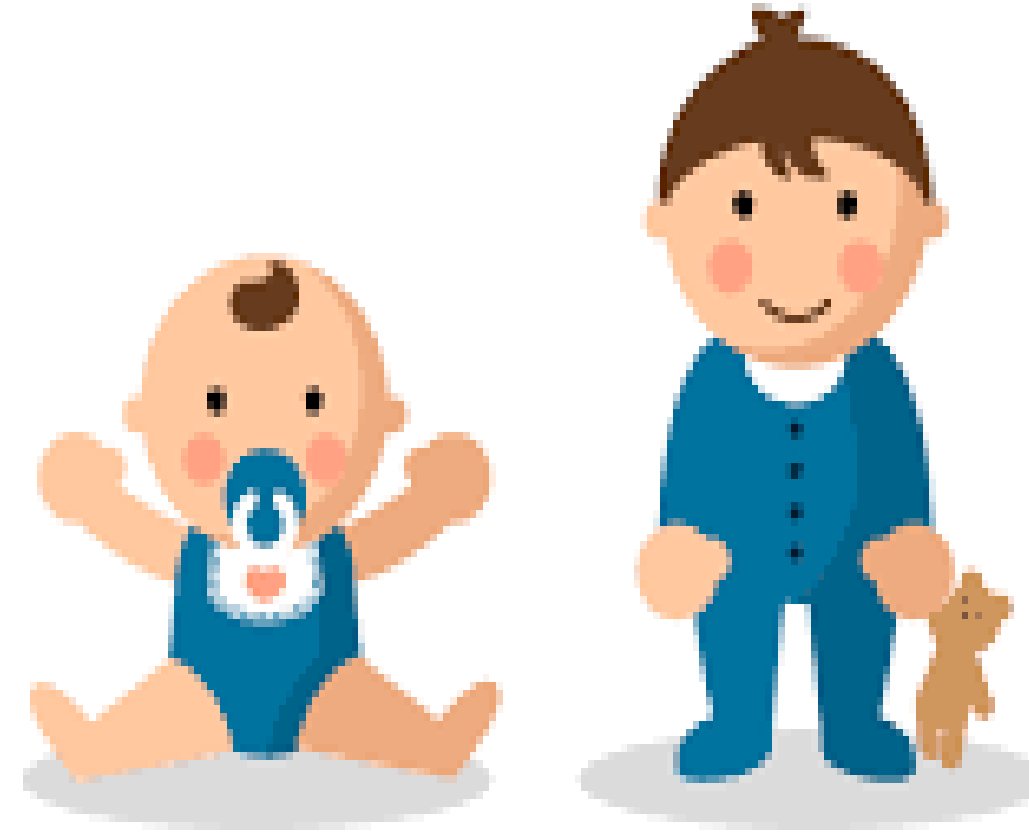
#### Anthropogenic sources



#### Natural sources



Dust < 250 µm  
Contain trace metals and polycyclic aromatic hydrocarbons (PAH)  
→ Ubiquitous + carcinogenic



Involuntary ingestion:  
20 - 100 mg of dust per day  
→ Early biological events

Children below 6 years old could be exposed to potentially harmful compounds and elements via ingestion of settled dust.

### AIMS

1. Characterize settled dust in preschools located in different environmental contexts
2. Evaluate DNA and chromosomal damage in gastric cells of pollutants' mixtures and settled dust

### DUST SAMPLING & CHARACTERIZATION

### COMPOUNDS LEVELS IN SAMPLED DUSTS

#### Samplings of settled dust in preschools of Bouches-du-Rhône (France)

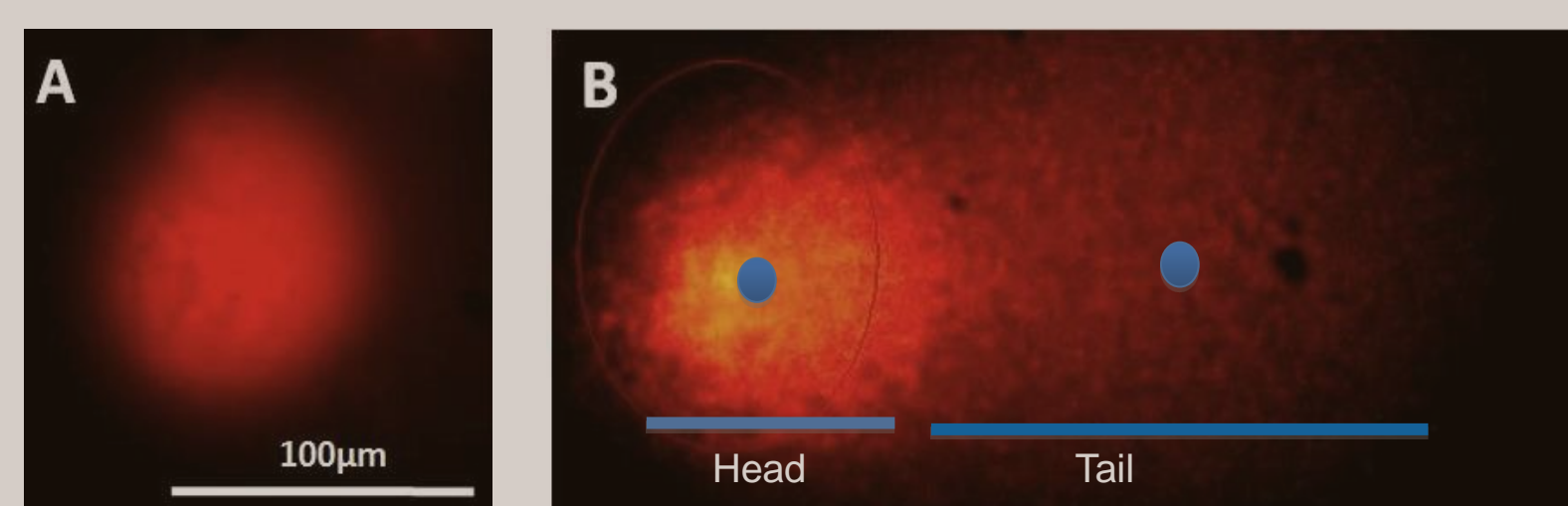
2015 -2016 / 2020-2021



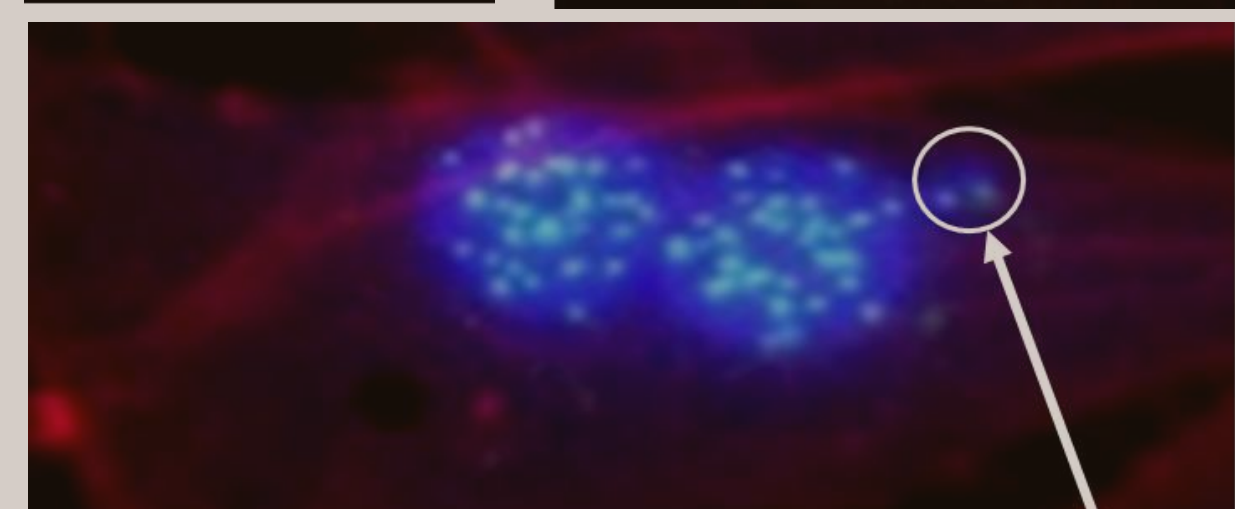
Figure 1: environmental contexts of the sampled preschools

#### Physical and chemical characterization of settled dust PAHs: HPLC-PFD / Trace metals: ICP-MS

#### In vitro toxicity on gastric cells of settled dust extracts and mixtures Cytotoxicity & Genotoxicity assays



Comet assay:  
DNA damage



Cytokinesis Block Micronucleus assay: chromosomal damage

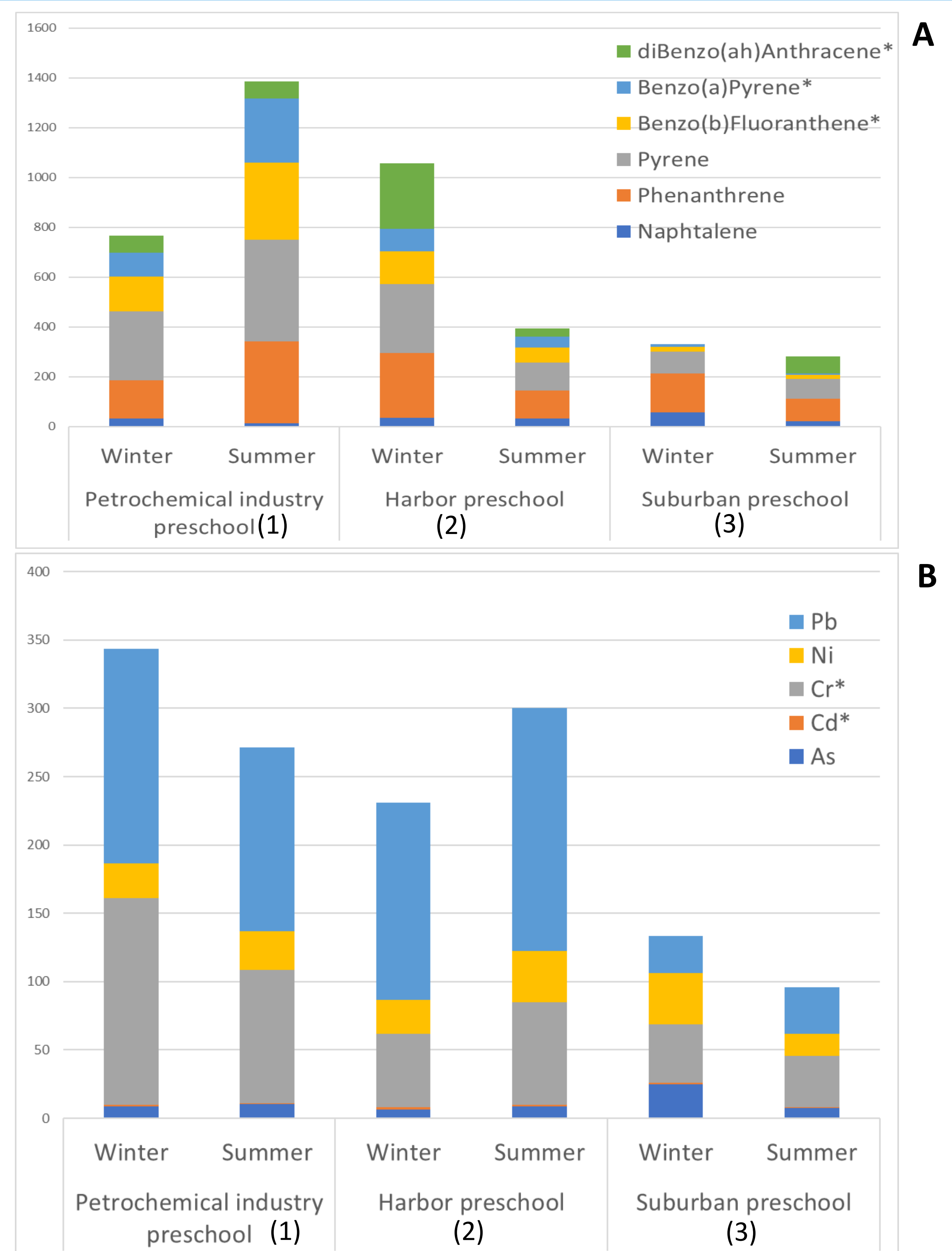


Figure 2: concentrations of 6 PAH (A) and of 5 trace metals (B) of interest in 3 preschools, in winter and summer 2015-2016, \* = carcinogenic

### PERSPECTIVES

Contribution to the understanding of:

- input of soil and aerial deposition of TM and PAH on settled dust,
- interactions between compounds in the occurrence of genotoxic hazard,
- hazards due to soil or settled dust ingestion.

Proposition of alternative *in vitro* tools for human health risk assessment of micropollutants in mixtures on contaminated soils.



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