

CHARACTERISING THE LINK BETWEEN INDOOR AIR, DUST AND TEXTILE CONTAMINATION

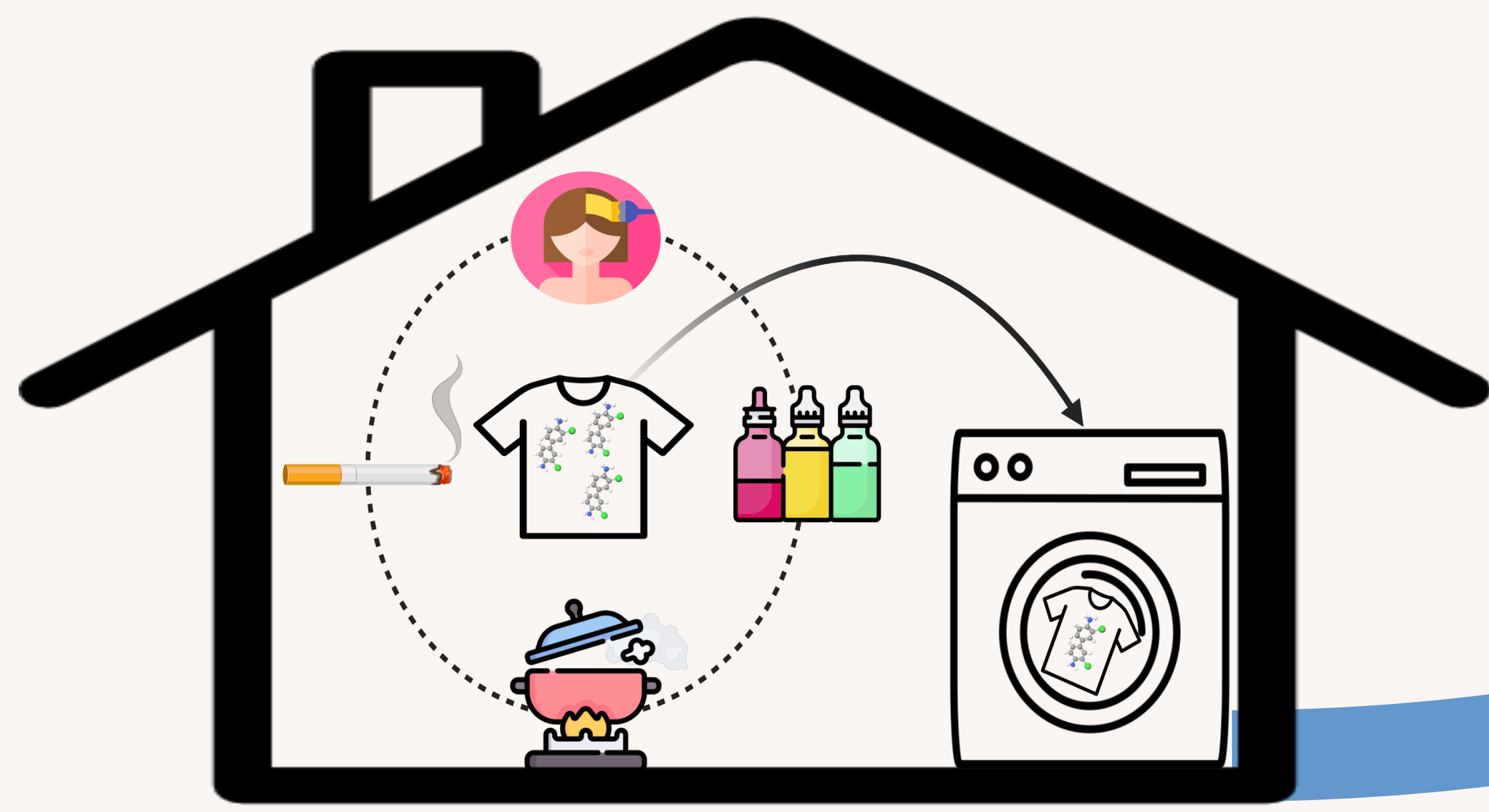
Özge Edebali, Lisa Melymuk

RECETOX, Faculty of Science, Masaryk University, Kotlarska 2, Brno 60200, Czech Republic
email: ozge.edebali@recetox.muni.cz

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BACKGROUND-AROMATIC AMINES

- Indoor environments can be a source of pollutants that can have negative effects on human health.
- Aromatic amines (AAs) are a group of hazardous chemicals¹ that have been reported in indoor air and dust.^{2,3}
- AAs are produced by industry and human activities: Textiles, rubber industries, cigarette smoke, hair dyes, and protein-enriched foods.^{3,4}
- Many AAs are carcinogenic and mutagenic.⁵

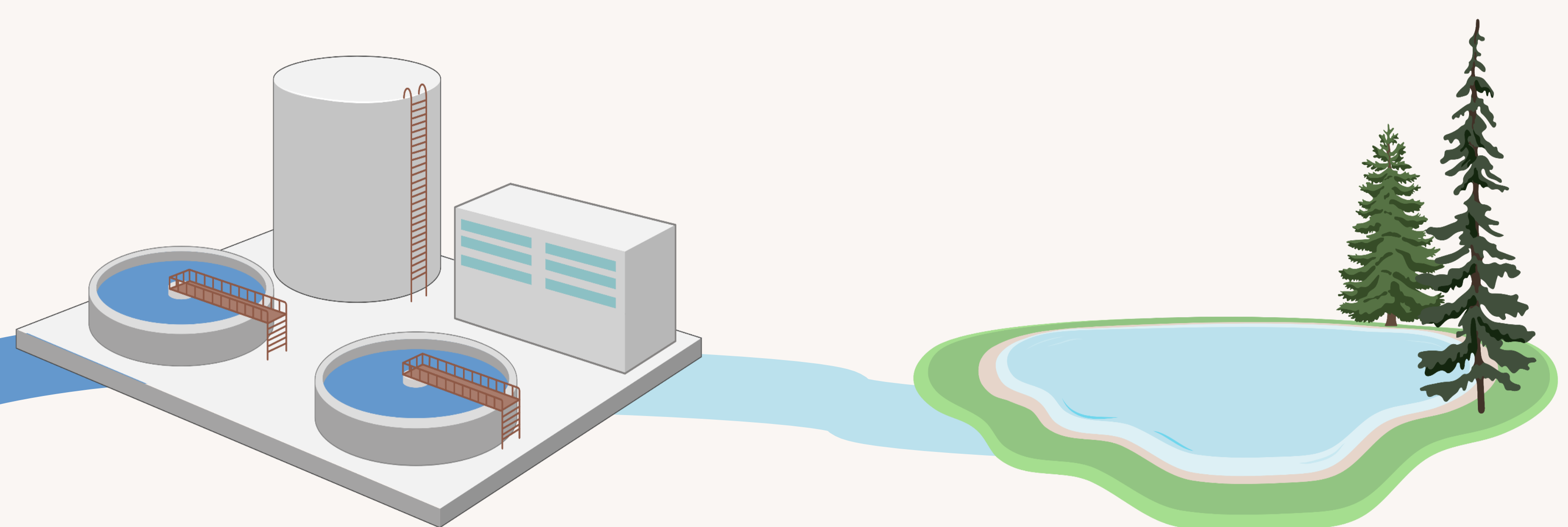


OBJECTIVES

- To investigate the absorption kinetics of AAs by textiles, examine the AA concentrations in indoor air, and dust compare the differences between indoor environments.

HYPOTHESIS

- We hypothesize a contaminant transport pathway linking indoor contamination to aquatic contamination through dust and air deposition and AA adsorption onto indoor textiles. Direct chemical absorption of AAs into textile materials is possible, as is particle deposition onto textiles.



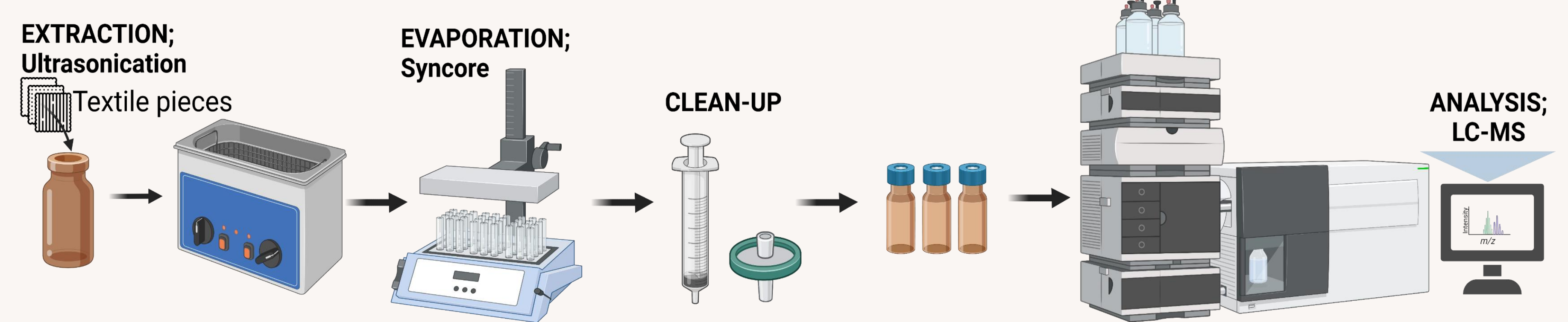
SAMPLING

Indoor environment sampling:

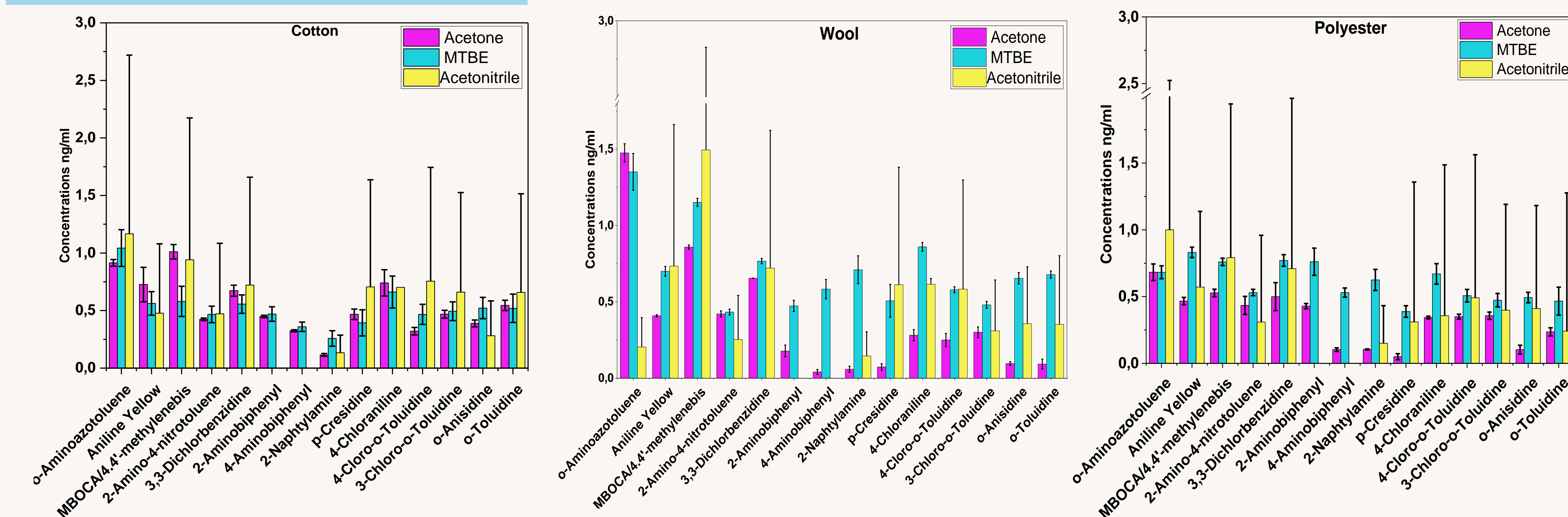
- Sampled matrices: textiles, air, and dust;
- Sampling locations: hairdresser's salon, smoking and non-smoking home, grill restaurant kitchen, smoking pub



METHODOLOGY-For textiles



TEXTILE EXTRACTION RESULTS

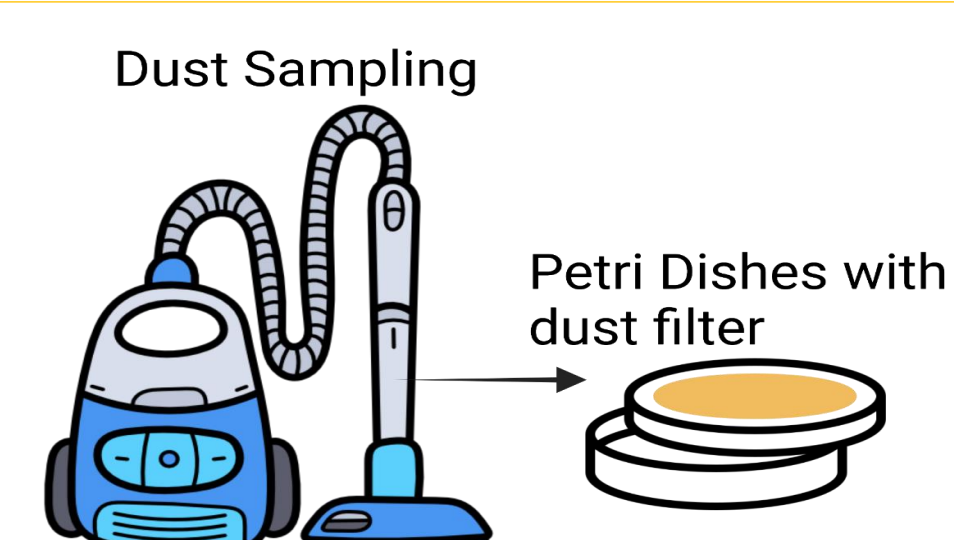
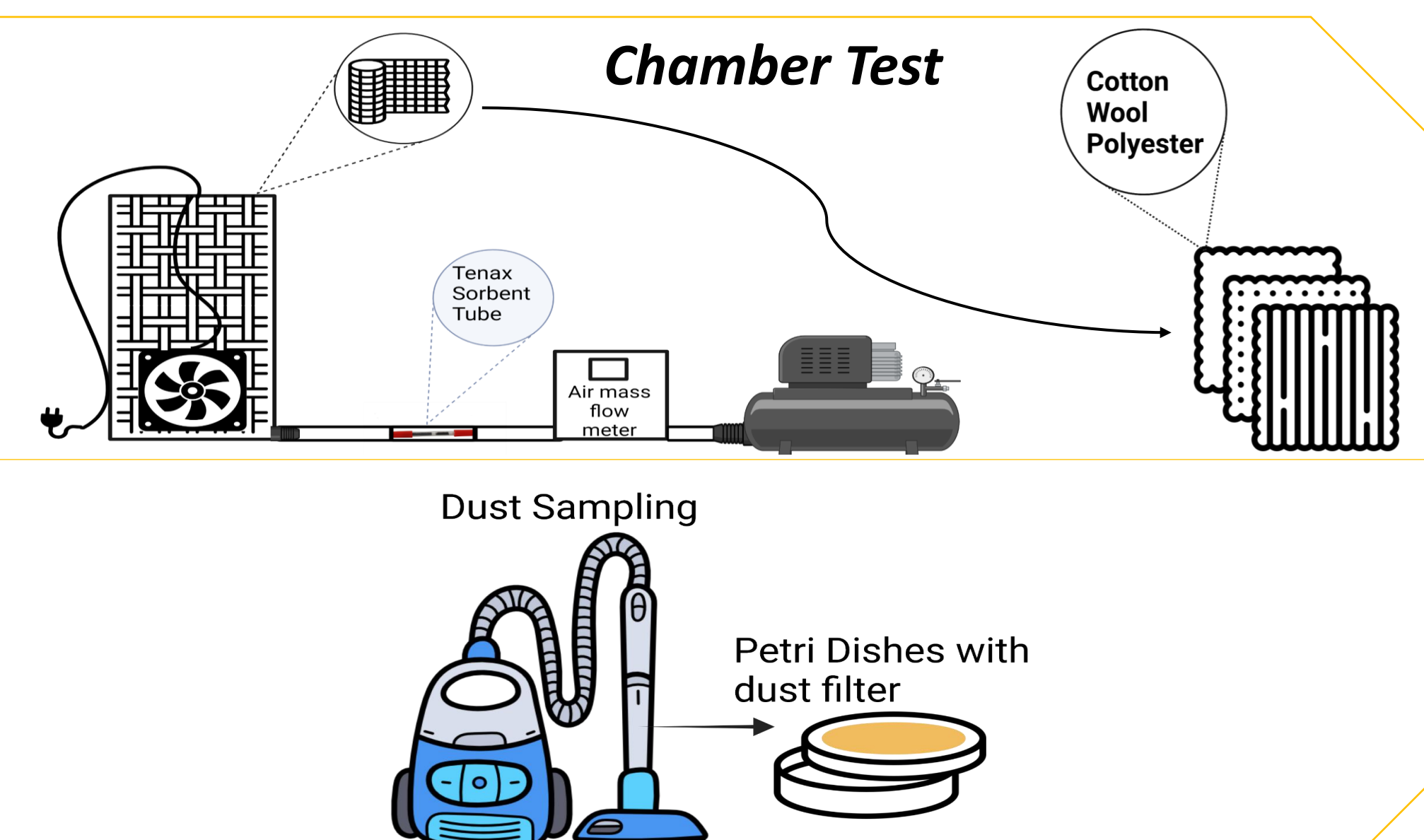


The selected textile extraction method will be ultrasonication in two 15-minute steps, and the solvent will be MTBE. Even though the efficiency of MTBE in cotton fabric is not the highest, the level of recovery at 53% is acceptable.

WHAT NEXT ?

The next steps of the project will involve:

- Conducting experiments to determine the textile-air partition coefficient of AAs under laboratory conditions in three types of textiles (cotton, wool, and polyester), and their concentrations in the air under equilibrium conditions.
- Characterizing the degree of contamination by AAs in indoor air and dust and examining the levels of AAs in different indoor environments. This will provide insights into the mechanisms that influence indoor distribution. Textiles will be used as a passive air sampler. Indoor air and dust samples will be collected.



References

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