1st Doctoral Conference RECETOX

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ENDOCRINE DISRUPTING POTENTIAL OF COMPOUNDS FROM INDOOR ENVIRONMENT

INTRO

- People spend more than 90% of their life in indoor environments[1].
- The chemicals present in indoor environments tend to accumulate, which may increase their potential for toxicity

AIMS

Characterization of toxic potential of complex chemical mixtures from different types of indoor environments.
Characterization of bioaccessibility of the mixtures and effect of biotransformation on their toxical potential

METHODOLOGY

- Dust collected by vacuum cleaner in old and new houses, schools, kindergartens, offices and cars
- Obtainment of the total mixture of dust samples by two types of extraction providing polar and non polar fractions of the mixtures
- Characterization of toxic potentials of bioacessible fractions of the mixtures using—Physiologically Based Extraction Test (PBET)
- The extracts containing complex mixtures of pollutants, their bioaccessible fraction and extracts after biotransformation treatment will be assessed for toxic potential by a set of reporter gene assays focused mainly on diverse endocrine disruptive potentials (Fig. 2)
- Extracts treated by S9 fration or an in vitro alternative to obtain biotransformed fraction of the dust-related pollutant mixtures
- Characterize toxicity drives from different fractions using mixture modeling and effect direct analyses(EDA)

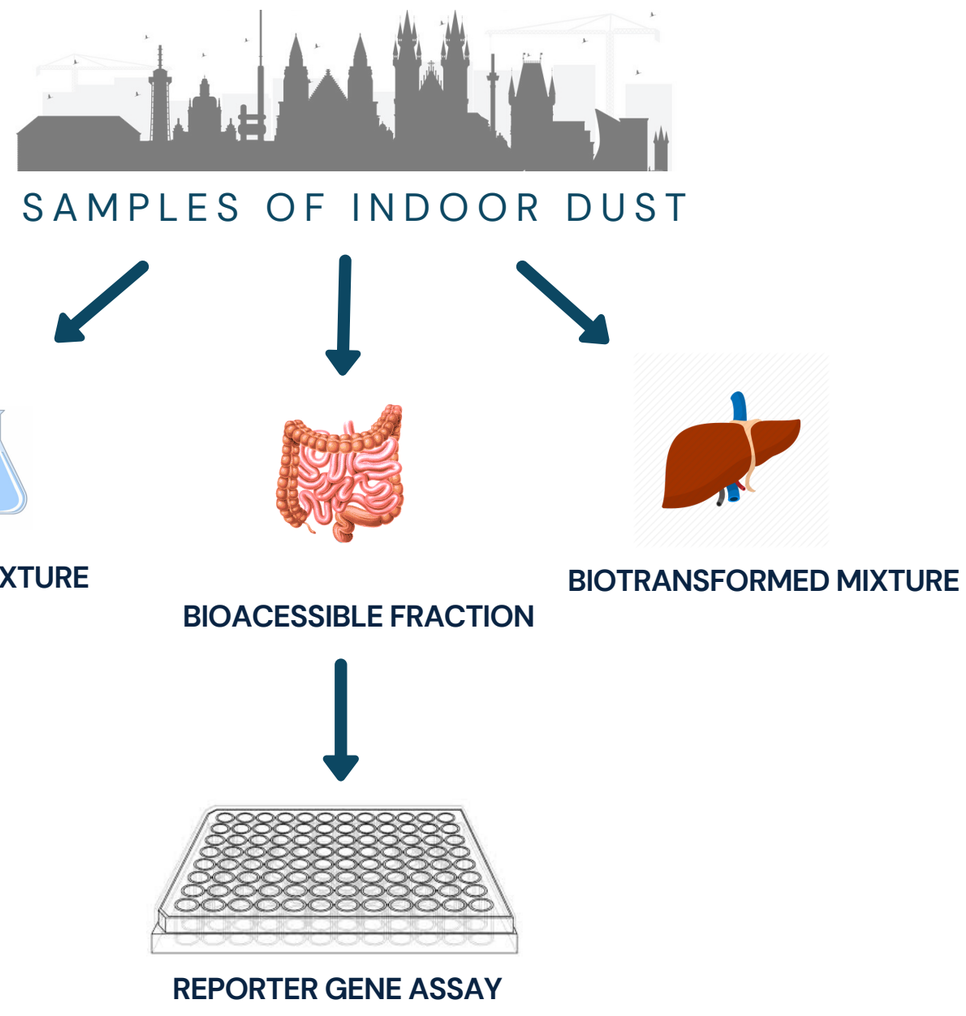


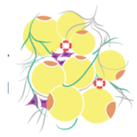
FIG. 01- SCHEMATIC REPRESENTATION OF THE METHODOLOGY THAT WILL BE EMPLOYED IN THE CURRENT PROJECT

ENDPOINTS

THYROID RECEPTORS
- METABOLISM
- NEURODEVELOPMENT

ESTROGEN RECEPTORS
- BREAST CANCER
- REPRODUCTION

ANDROGEN RECEPTORS
- MALES REPRODUCTION
- IMMUNE SYSTEM



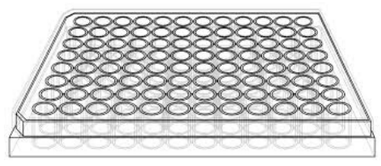
PEROXISOME PROLIFERATOR-ACTIVATED RECEPTOR
- LIPID METABOLISM

FIG. 02 - REPRESENTATION OF RECEPTORS THAT WILL BE EMPLOYED TO ASSESS POTENTIAL ENDOCRINE DISRUPTION USING REPORTER GENE ASSAYS

METHODOLOGY CURRENTLY USED

SAMPLES FROM OLD AND NEW HOUSES, SCHOOLS AND KINDERGARTENS

EXTRACTION WITH METHANOL



REPORTER GENE ASSAY - Az - AhR[2]

FIG. 03 - REPRESENTATION OF THE METHODOLOGY EMPLOYED TO OBTAIN THE PRELIMINARY DATA ON DIOXIN-LIKE ACTIVITY FROM THE TOTAL MIXTURE EXTRACTED WITH METHANOL

FIRST RESULTS

DIOXIN-LIKE ACTIVITY EXERTED BY SAMPLES EXTRACTED IN METHANOL FROM FOUR DIFFERENT INDOOR ENVIRONMENTS

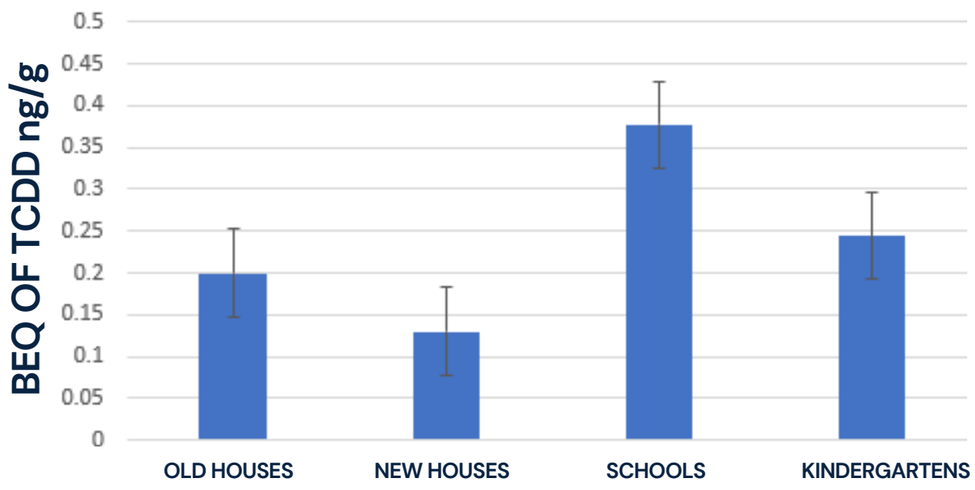


FIG. 04 - DIOXIN-LIKE ACTIVITY FOLLOWING THE EXPOSURE OF AZ - AHR CELLS. THE RESULTS ARE EXPRESSED AS BIOANALYTICAL EQUIVALENT [BEQ] OF 2,3,7,8 TETRACHLORODIBENZO-P-DIOXIN [TCDD] ng/g. THE WHISKERS REPRESENT THE MEAN +/ - STANDARD ERROR OF THE MEAN

CONCLUSION

THE CURRENT METHODOLOGY IS A SUITABLE TOOL TO DETECT DIOXIN-LIKE ACTIVITY IN INDOOR DUST SAMPLES.
THESE FIRST RESULTS INDICATE THAT THERE ARE ACTIVE COMPOUNDS IN SAMPLES FROM OLD AND NEW HOUSES, SCHOOLS AND KINDERGARTENS.
THE REST OF SAMPLES AND THEIR FRACTIONS WILL BE TESTED TOGETHER WITH OTHER PLANNED ENDPOINTS

REFERENCES

1 - Abbatt & Wang (2019) DOI : 10.1039/c9em00386j
2- Satsu et al. (2014) DOI : 10.1007/s10616-014-9711-6