INTRODUCTION & OBJECTIVES

- **Backgrounds**: Steroid hormones as a class of EDCs possess extremely high estrogenic potency, about 10,000-100,000 times higher than that of other EDCs. Due to the incomplete removal of these substances by conventional wastewater treatments, their continuous discharges into the aquatic environment causing pseudo persistence, and their potential to disrupt endocrine homeostasis in wildlife.

- **Current status**: LC-MS/MS or GC-MS/MS analysis only provides information about the concentration of steroid hormones. Active sampling collects samples on site and transports them back to the laboratory for analysis, which may lead to analyte contamination, induce post-sampling alterations and also result in loss of time and increased costs.

- **Objectives**: DGT as an in-situ passive sampling technique can overcome these limitations. The ERE-CALUX bioassay as an in vitro bioassay method can be used to assess the estrogenic potency of pollutants. The aim of our study is to develop a novel time integrated monitoring method for estrogenic effect of steroid hormones in water using DGT and the ERE-CALUX bioassay.

MATERIALS & METHODS

- **E2**, as a reference compound of steroid hormones in water solution, was pre-concentrated by o-DGT

\[
C_w = \frac{M_{dis} + E}{V}
\]

- **V** = Volume of the aqueous phase
- **M:** Accumulated mass of target compound
- **E:** Reference compound of steroid hormones
- **DGT** components, diffusive gel and filter do not significantly interfere with the ERE-CALUX assessment of estrogenic potency.

RESULTS & DISCUSSIONS

- **Adsorption by DGT holder, diffusive gel and membrane filter**

- **Diffusion coefficient of E2 in the hydrogel**

- **Effect of DOM (0-30 mg/L) on DGT trapping of E2**

- **Effect of pH (5-8) and ionic strength (0.001-0.5M) on DGT trapping of E2**

- **Estrogenic activity measured by DGT and spot sampling**

CONCLUSIONS

- DGT components, diffusive gel and filter do not significantly interfere with the ERE-CALUX assessment of estrogenic potency.
- The effective diffusion coefficient of E2 in agarose diffusive gel was \(4.65 \pm 0.37 \times 10^{-6}\ cm^2/s\) at 25 °C.
- The method was not affected by aqueous environmental parameters including pH (5-8), ionic strength (0.001-0.5 M) and DOM (0-30 mg/L).
- DGT/ERE-CALUX approach is an effective and sensitive tool for in situ monitoring of estrogenic activity in waters and wastewaters.

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