

# Development of Monitoring and Removal Strategies of Emerging Micropollutants in wastewaters

## Microplastics

## Pharmaceutical and Care Products

### Scientific and Technological Objectives



#### 1<sup>st</sup> Phase

##### Monitoring of Pharmaceuticals and Personal Care Products

- Produce **novel graphene-based sorbent materials** with remarkable properties such as high substrate selectivity (or even specificity towards definite target species), superior sorptive or adsorptive capacity and multifunctional behavior for the selective separation and **multiresidue determination of different groups of PPCPs**
- Provide cost-effective extractive media with enhanced chemical or mechanical stability by using novel microextraction (ME) preparation methods



#### 2<sup>nd</sup> Phase

##### Development of AOPs for the removal of PPCPs from wastewaters

- Development of a simple, efficient and commercially competitive technology of wastewater treatment for the removal of PPCPs by using **Advanced Oxidation Processes (AOPs)** (e.g. heterogeneous photocatalysis by using TiO<sub>2</sub> semiconductors and chlorine advanced oxidation technology)
- Examine the proposed methodology in **a pilot plant** system with final aim the wide scale applications
- Compare and evaluate AOPs** technology regarding effectiveness & cost



#### 3<sup>rd</sup> Phase

##### Sampling and monitoring of microplastics in urban wastewaters

- Design and validate of a high-volume **sampling device** with multiple mesh screens
- Develop an efficient sample **processing method** including density separation, clean up steps and biomass removal
- Evaluate the **new sampling strategy** for efficient and reliable measurement and characterization of microplastics in wastewaters
- Validate the measurements **by FT-IR spectroscopy, thermal analysis (TGA-DSC) and other techniques**

#### Project MOREM

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<http://morem.chem.auth.gr>

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MOREM

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##### Greece

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##### China

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