

Focus on Persistent, Mobile and Toxic chemicals (PM/PMT) : from water resource to human exposure

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Are you motivated by the quality of
aquatic environments and chemical
analysis?



Internship Context

This internship will focus on substances that are persistent, mobile and toxic (PMT) in the aquatic environment. These intrinsic substance properties allow them to spread from water resources to drinking water. Contamination can be irreparable as these substances remain in the environment, break through filters and survive drinking water treatment (Figure 1).

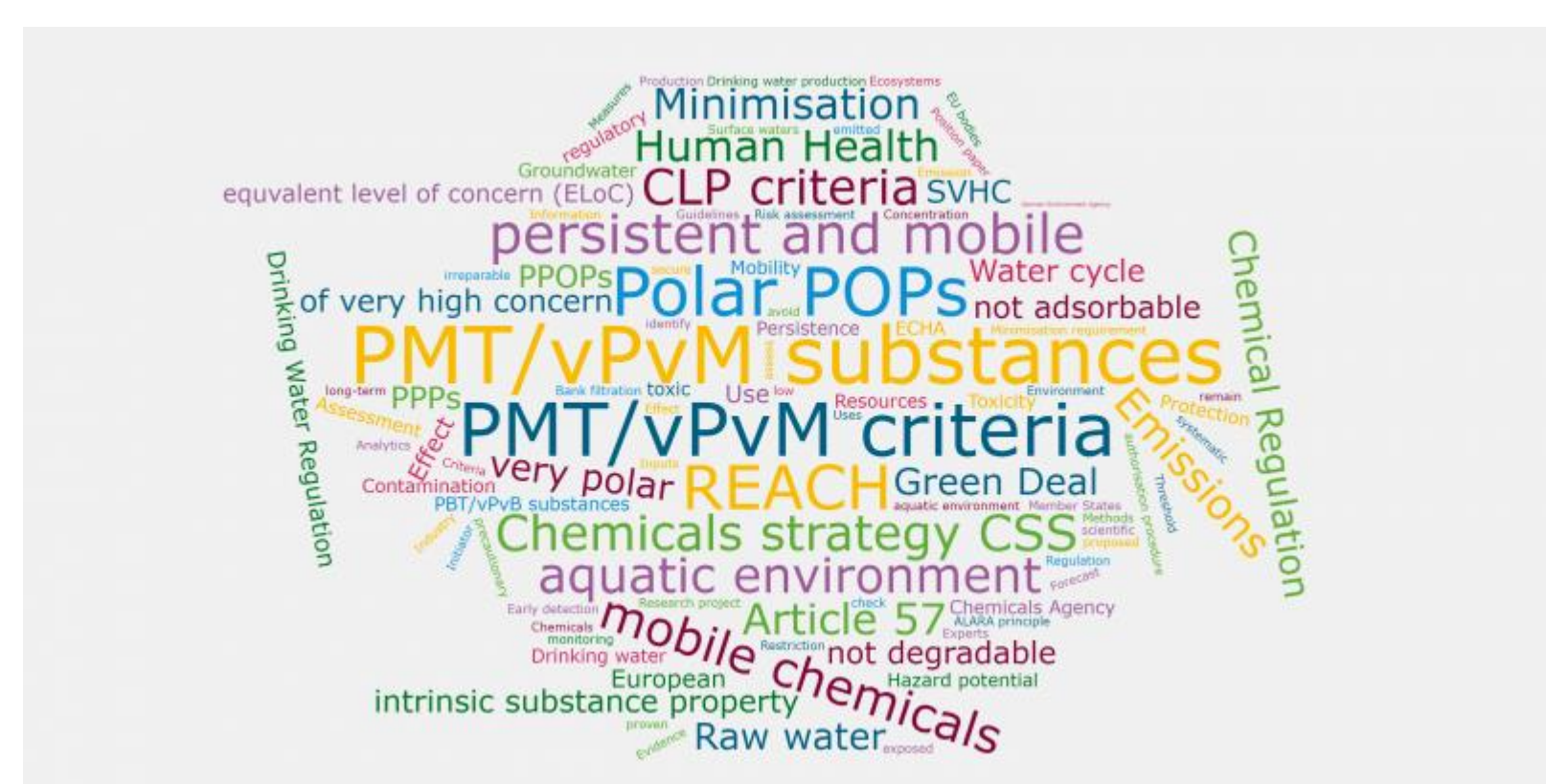


Figure 1 : Wordcloud related to PMT substances
<https://www.umweltbundesamt.de/en/PMT-substances>

PMT substances may accumulate in water, especially when wastewater is recycled and reach the resource for drinking water production. There are currently only few data available on contamination of water resources with PMT. It is important today, where many countries are turning to water reuse to alleviate water stress, to know the future risks associated with this practice.

Objectives of PMTfocus project

The objective of PMTfocus project is to investigate PM/PMT substances in groundwater, surface water and drinking water as part of the human emerging exposome. We will study a gradient of anthropic pressure on the water resources from no pressure *a priori* to increasing pressures depending on water treatment and reuse practices to identify i) whether PM/PMTs are present in resource water and in increasing concentrations according to the pressure on the resource ii) if different contexts/water use present different PMT profiles and iii) if drinking water may represent a route for human exposure to PMT and their transformation products. Finally, Human internal exposure to PMT will be assessed in urine samples, the most relevant fluid for PMT exposure.

To reach the objectives, several steps are necessary :

- Develop analytical methods for measuring PMT substances in drinking water and human biofluids
- Determine PM/PMT chemicals in the water cycle under different pressure gradient
- Determine PM/PMT chemicals in human urine



Figure 2: location of the main sites where water will be sampled in the frame of PMTfocus project

Water samples will be collected in different contexts/uses of water (Figure 2)

Urine samples will be collected in a mother-child cohort in Montpellier (cohort led by IDESP).

Internship objectives

The method for PMT substances quantification in water samples is currently under development. A preliminary work of the internship will consist in adapting this analytical method to urine samples to then be able to apply it to the cohort samples.

The student will then be involved in the development of the method and the analyses of water and urine samples. He/she will be involved as well in the reporting of the project (deliverables, publications).

The student will be trained in the preparation of environmental samples and in liquid chromatography coupled with high resolution mass spectrometry. This is an ideal internship for a student wishing to work in the field of water quality.