



Suspected-target screening strategy to investigate degradation by ozonation or photolysis of urban micropollutants in waste waters

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SUSPECTED-TARGET SCREENING STRATEGY TO INVESTIGATE DEGRADATION BY OZONATION OR PHOTOLYSIS OF URBAN MICROPOLLUTANTS IN WASTEWATERS

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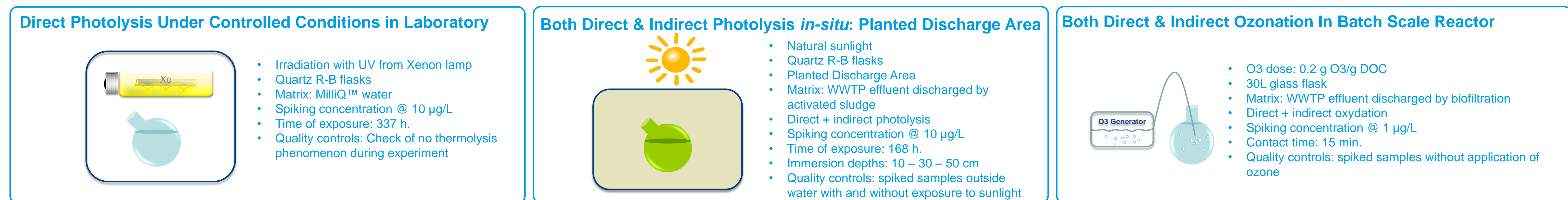
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INTRODUCTION

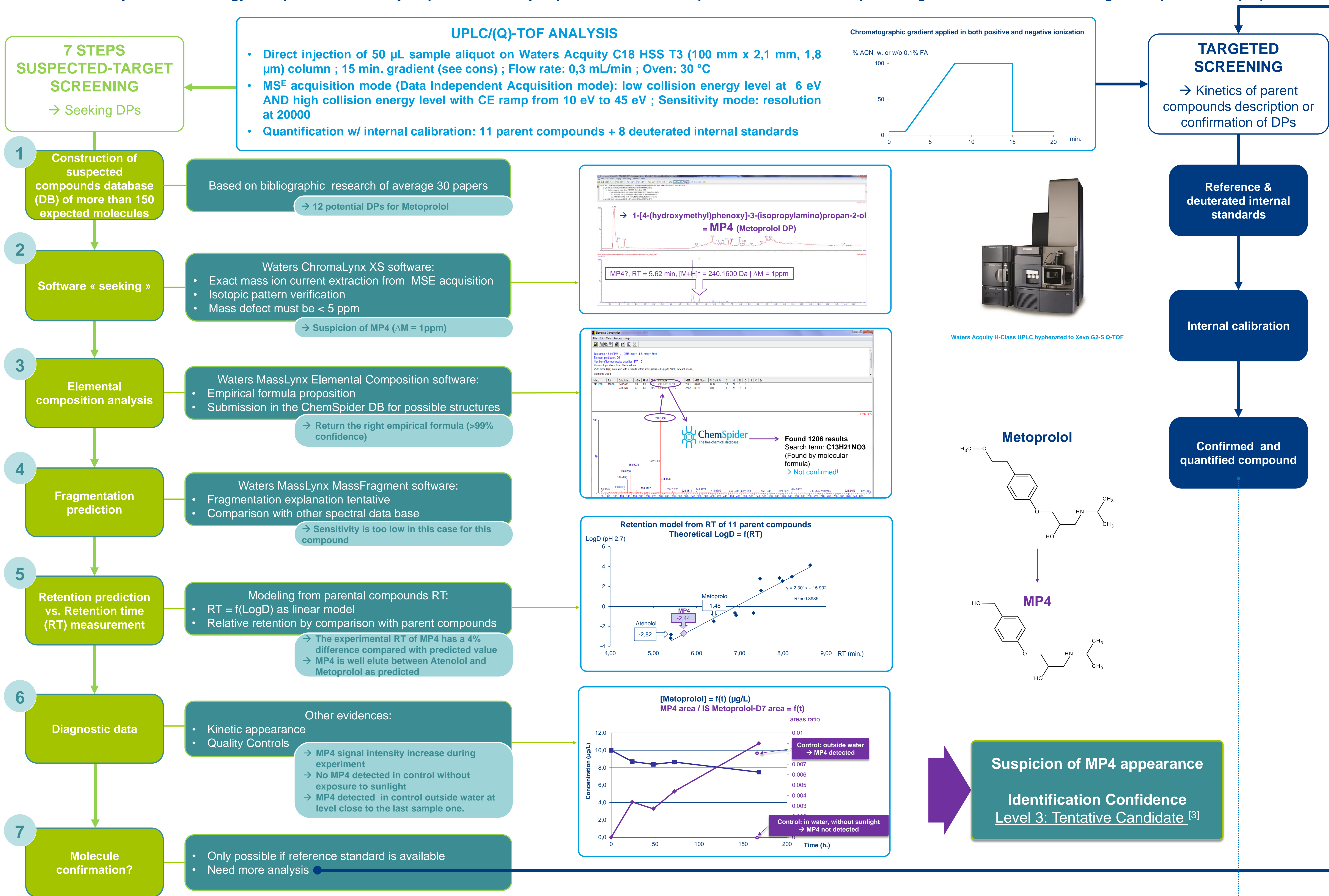
Conventional wastewater treatment plants (WWTPs) partially eliminate micropollutants present in domestic and industrial discharges (Martin-Ruel *et al.*, 2010; Choubert *et al.*, 2011). However, some molecules still occur in effluents of WWTPs at concentrations close to 0.1 µg/L for some pesticides (e.g. diuron) and pharmaceuticals (e.g., carbamazepine, sotalol, diclofenac). The potential harmfulness of these compounds requires the development of new treatment processes (tertiary) to anticipate possible regulation changes. The aim of this poster is to present our analytical methodology to identify degradation products (DPs) created under various conditions during lab-scale or *in-situ* experiments and that will be applied to tertiary treatment processes.

DIFFERENT TYPES OF EXPERIMENTS TO SIMULATE DEGRADATION OF MICROPOLLUTANTS

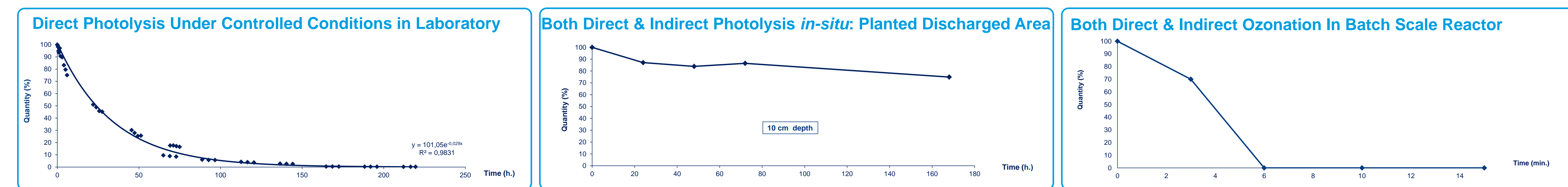


QUALITATIVE & QUANTITATIVE ANALYTICAL STRATEGY

Focus on the analytical methodology set up in our laboratory as part of the study of pharmaceuticals and pesticides: Case of Metoprolol degradation in Planted Discharge Area (at 10 cm depth)



EXAMPLE OF TARGETED SCREENING OVERCOMES FOR METOPROLOL DEGRADATION



CONCLUSION & PERSPECTIVES

- The sensitivity is a critical point for identification, hence we must concentrate samples with solid phase extraction before instrumental analysis.
- To confirm, ultimately, the nature of DPs, we need to acquire, where possible, the reference standards. At this point we could consider a quantitative analysis approach.
- This strategy is being implemented on 11 compounds that are the subject of a study as part of the thesis of Baptiste Mathon. This study will be a subsequent valorization.
- We also need more tools to confirm our structures like sharing spectral databases. NORMAN MassBank is one of them [4] but nowadays it doesn't allow MS^E spectra comparisons (typically Data Independent Acquisition from Waters instrumentation).
- Working on real matrices (WWTP effluents), we need to enlarge our database to biodegradation products. To do this we will use *in-silico* computational prediction tools. Some of them are freely available (<http://eawag-bdd.ethz.ch/>) [4].