

## Best Analytical Chemistry Poster Presentation at Environ 2023

Winner: Aicha Tasfaout, Dublin City University

### In-situ design of molecularly imprinted polymer interfaces for electrochemical sensing of contaminants in water

Emerging contaminants in water are a topic of growing concern in environmental research, and efforts to improve their detection and extraction from water should be emphasised.

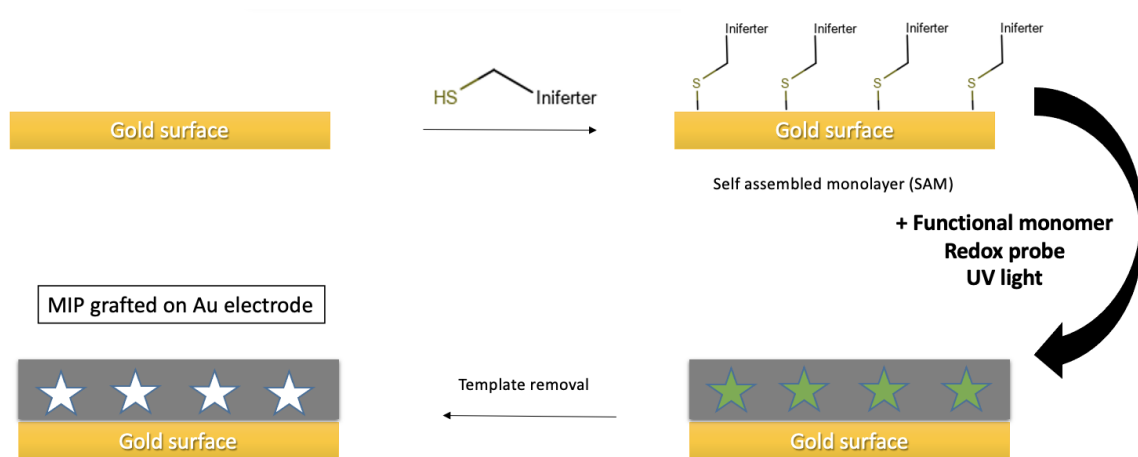


Molecularly imprinted polymers (MIPs) have been used in solid phase extraction (SPE) and sample preparation techniques thanks to their high selectivity and the “lock and key” effect occurring during binding with target molecules in their recognition sites.

My master's project at the Water Institute in Dublin City University aims at investigating the performance and efficacy of electrochemical MIPs (eMIPs) for three groups of emerging contaminants: polyaromatic hydrocarbons (PAH), perfluoroalkyl substances (PFAS) and organic UV filters, as part of the MarTERA funded NEMO project (NEw biomimetic Lab-on-Chip devices for marine water MOnitoring).

My work presented at the 2023 Environ conference at ATU Donegal highlighted a strategy where MIPs were grafted onto gold microelectrodes as part of a sensor to allow in-situ real-time detection of an emerging persistent contaminant and organic UV filter *2-Ethylhexyl 2-cyano-3,3-diphenyl prop-2-enoate* (octocrylene). The grafting was possible thanks to forming self-assembled monolayers (SAM) of an iniferter on the gold surface, made possible by the gold-sulphur bonds between the surface and thiol groups in the

iniferter. The electrochemical probe (ferrocene methylmethacrylate, FcMMA) incorporated in the MIP matrix allows for fast and simple detection of binding events when the target molecules are added to the spiked water sample. Cyclic voltammetry (CV) and differential pulse voltammetry are used to quantify the presence of octocrylene, and to determine a limit of detection (LOD) and limit of quantification (LOQ) for the electrochemical sensor. The electrochemical response obtained from both techniques did not, in fact, show the expected signal from immobilised FcMMA. Thus new efforts will be done toward investigating the possible adsorption of octocrylene on the MIP-modified electrode surface of the sensor.



For more information on the project:

**Visit:** <https://dcuwater.ie/projects/new-biomimetic-lab-on-chip-device-for-marine-water-monitoring/>

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