PhotoClean

Photoactive microswimmers for selective catching, detection and removal of emerging pollutants

Timeline | 09/2023 to 08/2026

Budget | 137.500 €

ICIQ People | Katherine Villa Research Group

Call | Proyectos I+D - Generación Conocimiento 2022

SUMMARY

Water contamination caused by anthropogenic and industrial activities is considered a serious environmental issue nowadays. In particular, the selective removal of low concentrations of toxic persistent organic pollutants from contaminated water that contains high concentrations of less harmful pollutants remains a great environmental challenge. This research project (**PhotoClean**) deals with the development of efficient self-propelled photocatalytic microswimmers with surface recognition sites for the removal of persistent organic pollutants from contaminated water under sun-like irradiation. The main goal is to modify the surface of photocatalytic microswimmers by molecular polymer imprinting to selectively target a specific pollutant from a complex liquid environment. This will result in higher pollutant removal efficiencies compared to the unmodified ones. Moreover, the decoration of these photocatalytic microswimmers with a plasmonic compartment will provide them with advanced functionalities to perform both selective degradation of low concentration of toxic pollutants with the simultaneous monitoring of the reaction mechanisms by surface enhanced Raman scattering. Therefore, **PhotoClean** will contribute to the development of alternative water cleaning approaches to overcome current environmental challenges with far-reaching scientific and socio-economic impacts.