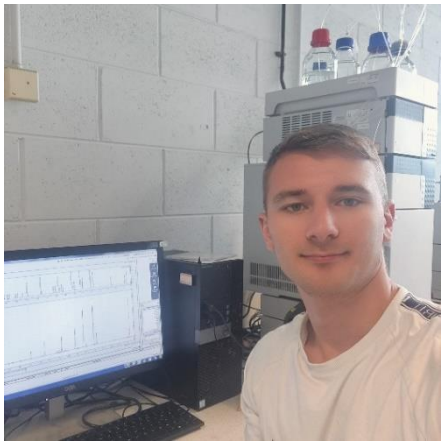
Best Analytical Chemistry Poster at Environ 2021
Winner Dylan O'Flynn, Dublin City University

Method development for the determination of emerging pharmaceutical contaminants in surface water environments



Globally, pharmaceuticals are increasingly being found at µg/L to ng/L concentrations in surface water environments. However, there is limited data available on the occurrence, concentrations, fate or toxicological implications of these pharmaceuticals in Ireland. The continual release, stability and biological activity of these "micro-pollutants" can lead to chronic environmental exposure, with ensuing behavioural and health-related effects to wildlife and potentially to humans.

The objective of the EMPIRE project is to determine the presence and concentrations of pharmaceuticals in surface water and relate it to potential environmental effects to aquatic ecosystems. In this project, 11 pharmaceuticals of emerging concern are investigated, such as diclofenac, trimethoprim, ciprofloxacin, sulfamethoxazole, amoxicillin, gemfibrozil, venlafaxine, carbamazepine, Estrone, 17a-ethylene estradiol, 17β-estradiol.

Grab and passive sampling of surface water will be used alongside solid-phase extraction and HPLC-UV and LC-MS/MS analysis to determine the occurrence and concentrations of these pharmaceuticals of interest while providing a robust method to systematically monitor the occurrence of pharmaceuticals in surface waters at environmentally relevant concentrations.