

LIFE Impetus: improving current barriers for controlling pharmaceutical compounds in wastewater treatment plants

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Abstract: The LIFE Impetus project constitutes an innovative approach for addressing the challenge of controlling pharmaceutical compounds (PhCs) in urban wastewater treatment plants (WWTPs). It aims to demonstrate a low-cost investment and easy-to-implement solution, cost-effective and resource (chemicals and energy) efficient. Improvement measures based on operating and chemical enhancement strategies for PhCs control are demonstrated at pilot and full-scale. Operating strategies are identified by using benchmarking tools to deliver WWTP overall good performance with respect to water quality, energy and chemicals efficiency. The chemical enhancement strategies use eco-friendly adsorbents and natural coagulants. This poster will present an overview of the LIFE IMPETUS and its main results.

Keywords: continuous improvement; pharmaceutical compounds; urban wastewater treatment

The LIFE Impetus project (2016-2019) aims at demonstrating feasible measures for improving the control of PhCs in urban WWTPs with conventional activated sludge (CAS) treatment. As CAS is the most common biological process in urban WWTPs, the solutions may be easily transferred to wastewater treatment worldwide. A complementary objective is to produce valuable knowledge for water resource protection from PhCs and associated environmental policy on PhC occurrence and concentration, control in WWTPs, bacterial antibiotic resistance and PhC bioaccumulation in clams. The treatment improvement targeted is to be achieved through the use of resource efficient processes, namely chemical enhancement with activated carbon adsorbents of vegetal origin and biopolymers used as coagulants, complemented with energy efficiency and overall improvement of WWTP performance through the use of benchmarking tools.

The LIFE Impetus project presents a strong analytical component to assess the baseline and the improvement measures. A total of 24 PhCs belonging to 10 therapeutic classes were selected upon the occurrence, persistency and recalcitrance towards conventional treatment in WWTPs. The target compounds include analgesic drugs, antibiotics, non-steroidal anti-inflammatory drugs, beta-blockers drugs, antidepressant drugs, anticonvulsant drugs, lipid regulators, corticosteroid, psycho-stimulant drugs and sexual hormones. Extensive data on PhC occurrence in urban wastewaters (~ 850 samples analysed for 24 PhCs) and on PhC accumulation in clams (~ 150 samples analysed for 24 PhCs) are being produced.

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