Modelling the occurrence, transport and fate of pharmaceuticals in wastewater systems - DTU Orbit (23/08/2019)

This paper demonstrates how occurrence, transport and fate of pharmaceuticals at trace levels can be assessed when modelling wastewater treatment systems using two case studies. Firstly, two approaches based on: 1) phenomenology; and, 2) Markov Chains, are developed to describe the dynamics of pharmaceuticals with or without clear administration patterns. Additional simulations also show that sewer conditions might have an important effect on the behaviour of the generated compounds and their metabolites. The results demonstrate that different operating conditions in wastewater treatment plants can have opposite effects on the studied pharmaceuticals, especially when they present co-metabolic or inhibitory behaviour in the presence of biodegradable substrate. Finally, the paper ends with: i) a critical discussion of the presented results; ii) a thorough analysis of the limitations of the proposed approach; and, iii) future pathways to improve the overall modelling of micropollutants.

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