



Antibiotic-resistant bacteria and their genes in wastewater

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Motivation

Antibiotics have been used excessively for humans and livestock worldwide since the first clinical use of penicillin. This leads to an emergence of antibiotic resistance bacteria (ARB) and antibiotic resistance genes (ARG) in the environment. Antibiotic resistance develops faster than new antibiotics are being developed, as developing new antibiotics is becoming increasingly challenging and costly.

The increasing threat of ARB&G from year to year requires further screening, monitoring and improved treatment technologies to remove ARB&G.

Technological challenge

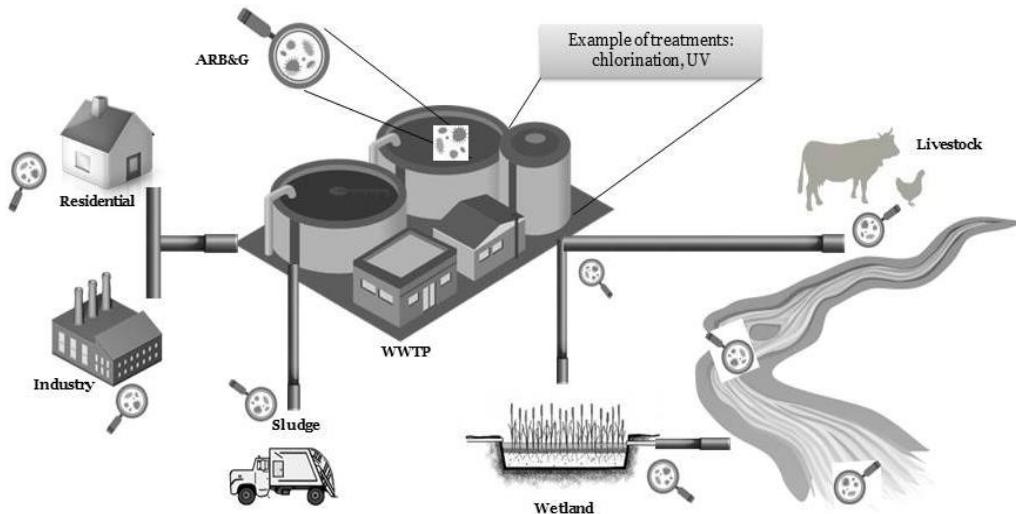
The technological challenge is to further investigate the dissemination of ARB&G from WWTPs and wetlands to catchments, the effectiveness of existing WWTPs and wetlands in removing ARB&G, as well as to develop new methods for removing ARB&G.

This research is divided into three parts:

The first part focuses on screening and monitoring of ARB&G in selected catchments, WWTPs and wetlands. This is important to get an overview of the prevalence of ARB&G in the Netherlands and to observe the effectiveness of present WWTPs and wetlands in removing ARB&G. Methods include sampling at different geographical locations, selection and measurements of antibiotics, ARB&G, and water quality and nutrient contents in water and sediment of the systems.

The second part of the research is to determine the specific resistance genes of ARB&G. This is to ensure that the bacterial isolates harbour a variety of ARB&G. The distribution of ARB&G will be determined by qPCR.

The last part of the research is to develop a new method to remove ARB&G. This can be a new technology or a combination of existing technologies.



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