Abstract

Bacterial antimicrobial resistance (AMR) is one of the greatest global threats and public health challenges currently facing humanity. The AMR problem should be addressed holistically from the perspective of various fields of science in the spirit of the One Health concept. This concept indicates the need to investigate potential routes of transmission of drug-resistant bacteria between different environments. Priority research areas identified in relation to AMR transmission focus on, among others: on understanding the impact of wastewater and wastewater management on the spread of AMR in various sectors. Therefore, the main aim of the research undertaken as part of this doctoral thesis was to determine the role of municipal and hospital wastewater in the spread of drug resistance in the environment. The results of the work indicated that hospital and municipal sewage play an important role in the spread of drug resistance in the environment through the transmission of drug resistance genes and live drug-resistant priority alert pathogens, posing the greatest threat to human health. The methods used to disinfect hospital sewage and treat municipal sewage seem to be ineffective in removing microbiological contaminants. Therefore, urgent legislative action is needed to introduce permanent, regular monitoring of AMR in the environment and to select important indicators for assessing the safety of wastewater and the effectiveness of its treatment processes.