Chemotherapy is the method of choice for cancer treatment. Along with an increasing number of new cancer cases, a subsequent increase in anticancer drug (ACD) consumption is observed. Although the use of ACDs is difficult to assess because of the increasing number of cancer diagnoses. Anticancer drugs (ACDs) exhibit high biological activity, they are cytotoxic, genotoxic, and are constantly released into the environment as a result of incomplete metabolism. Consequently they pose a serious threat to the environment and human health due to their carcinogenic, mutagenic and/or reproductive toxicity properties.

Knowledge of their bioavailability, including their sorption to soils and their impact on the soil-groundwater pathway, is crucial for their risk assessment. The information about ACDs sorption onto soils and their mobility in the environment are poorly. Mioduszewska et al. demonstrate that cyclophosphamide and ifosfamide are compounds mobile, and other organic pollutants decrease the mobility of anticancer drugs in the environment. So far only a few studies about the adsorption of anticancer drugs onto activated sludge as a way of eliminating these micropollutants from wastewater have been conducted. Lenz et al. have demonstrated that cancerostatic platinum compounds (CPCs) have a potential to sorb onto activated sludge. This indicates the possibility of occurrences of anticancer drugs in soil, due to the use of sludge as a fertilizer.

The main aim of this project is to assessment mobility and understand the mechanisms associated with sorption and desorption of anticancer drugs and their metabolites in soils with heavy metals, which quantities in the environment are significant for live organisms. Understanding the mechanism of sorption and simultaneously studying the environmental fate of anticancer drugs in the solid/liquid phase system, will display the human impact on environment components. Additionally check interaction anticancer drugs heavy metals – the solid matrix are reservoir many impurities wherefore one of hypotheses is occurrence mixture sorption. This project represent pioneering study of sorption anticancer drugs with heavy metals. The study of immobilization anticancer drugs onto activated system give information about pathways of anticancer drugs in environment system. Selected analytes are cyclophosphamide, ifosfamide, 5-fluorouracil, methotrexate and/or 7-hydroxymethotrexate. Selected co-contaminants are enclosed in The State Environmental Monitoring Programme. Heavy metals represented charged inorganic pollutants. For this project representative of heavy metals will be cadmium ion (Cd^{2+}). Since in most cases the main mechanism of sorption of heavy metals to various surfaces of sorbents is ion exchange and complexation of the sorbent surface. This indicates the ability to block the active sites of the sorbent, due to the presence of strong interactions with the surface of the soil. On the other hand, the presence of multivalent elements favors the formation of cationic bridges, by which is understood to create new active sites for anionic compounds.