Growth in the use of anticancer drugs contributes to increased levels of cytostatics released to the environment. These drugs are found in surface water, ground water and even drinking one. Their concentration in the hospital effluents comes up to a quarter million ng/L. In addition, these compounds are not effectively removed during wastewater treatment plant (WWTP) processes. This means that they can be a potential threat to the environment. Especially aquatic organisms, but also humans, who are water consumers, can be affected. These are the main reasons to take up the research problem. Although the current knowledge about cytostatic agents remains insufficient, it is well known that they exhibit carcinogenic (promote formation of cancer), mutagenic (change the genetic material), teratogenic (cause abnormalities of physiological development), genotoxic (damage the genetic information), and embryotoxic (poisonous to embryos) effects. For this reason, the research on the effective elimination of cytostatic drugs from the environment is necessary.

The main aim of this study is to evaluate utility of fungi and improve their removal efficiency of cytostatic drugs from environment, on the example on two selected pharmaceuticals: bleomycin and vincristine. The research hypothesis is that these organisms can remove anticancer drugs because they produce enzymes that have the ability to biodegrade a number of xenobiotics and the removal strongly depends on process conditions.

In the presented project the evaluation of cytostatics removal by particular fungi (*Fomes fomentarius* (CB13), *Hypholoma fasciculare* (CB15), *Phyllotopsis nidulans* (CB14), *Pleurotus ostreatus* (BWPH), and *Trametes versicolor* (CB8)) will be accomplished. The impact of physicochemical conditions (such as different contact time, way of shaking and aeration, type of solid support, drug concentration) on the effectiveness of the elimination process of the pharmaceuticals will be studied. Identification of the cytostatics transformation products will be conducted as well. This project will explore which of the chosen ligninolytic enzymes participate in drugs decomposition, as well. The toxicity of the post-process samples will be examined, too. Bioreactor studies in sterile, non-sterile and implemented with active sludge conditions with immobilised mycelium will be also conducted. Here, the impact of physicochemical conditions (such as pH adjustment, nutrient addition, type of solid support) on the effectiveness of the elimination process of the pharmaceuticals will be studied, too. Such an investigation will broaden the knowledge about the ability of fungi to remove this group of compounds and will cause the development of the scientific discipline.