

Medicinal substances belong to xenobiotics – chemicals foreign to the body, often having hydrophobic character. In order to remove them from the body a change into hydrophilic metabolites is required. These transformations are carried out by means of enzymes of cytochrome P450 family, located mainly in the liver. Specific identification of metabolites and by-products formed during the biotransformation is crucial to elucidate the mechanism of action of xenobiotics on the human body and determine their toxicity. Current research associated with the use of chemical compounds with artificial active centers that can mimic the reactions carried out by liver enzymes inspires hopes. So far it has been shown that compounds belonging to porphyrinoids family have the ability to catalyze the oxidation reactions of chemicals, similar to those carried out by cytochrome P450 enzymes.

The planned research is aimed to obtain phthalocyanines substituted with L-menthol containing transition metals (Fe(II), Mn(II), Co(II)) in the coordination center. Obtained materials will be incorporated in the mesoporous silica SBA-15 and then used to construct system generating reactive forms of oxygen. Phthalocyanines encapsulated in SBA-15 will be used to carry out the oxidation reaction of cyclohexene and omeprazole, felodypine - a medicinal substances in the presence of additional oxidizing agent ie. hydrogen peroxide or *tert*-butyl hydroperoxide.

The phthalocyanines functions depend mainly on the characteristic of electron transfer associated with the type of metal ion present in the coordination center. So it is interesting to determine which of the obtained complexes will be the most effective as a catalyst. This project should also allow to verify the issues of the research, which is to assess the possibility to obtain phthalocyanines selectively catalyzing the oxidation reactions in order to obtain stereoselective products.

Due to the crucial influence of xenobiotics on our body, obtained results can significantly contribute to the knowledge of the chemical structure of their metabolites, which are often difficult to obtain by chemical synthesis. Reconstruction of reactions catalyzed by cytochrome P450 under controlled conditions may accelerate research of pharmaceutical tests and tests of metabolism of many substances including drugs. Traditional sample preparation for pharmacological and toxicological studies in vitro is costly and often requires the involvement of a large group of people or animals. The use of chemical compounds that can mimic the reactions carried out by liver enzymes would reduce the costs of research, as well as it will allow the acquisition in laboratory conditions larger quantities of the biomimetic reaction products for further analysis.