

Project 2.1 Chemoenzymatic cascades of new Cu reactions of significant application potential

Supervisor: Prof. Ryszard Ostaszewski

Institute: Institute of Organic Chemistry Polish Academy of Sciences.

Unit: research group XX

WWW: <https://www.icho.edu.pl/en/zespole/ryszard-ostaszewski-group/>

Background:

Reports preparation, publications preparation, synthesis of organic compounds using copper catalyzed organic reactions and enzymatic reactions.

Aim:

Currently, an increase in the incidence of cancer is observed, thus it is extremely important to eliminate or limit them. One of types of cancer is multidrug resistant (MDR) solid tumors. This is the subject of COST action CA17104. The key challenge of this action is an identification of a new diagnostic/predictive biomarkers, producing new and safe compounds applicable to personalized treatments of MDR tumors. In order to achieve such goal, we need to design new synthetic protocols providing organic compounds of defined structure, free from any impurities. Therefore, during the realization of project we will study a new type of organic reactions catalyzed by copper salts, which provide molecules of high activity towards MDR. To achieve success, we need to know reaction scope and limitations, reaction mechanisms and optimal conditions for successful synthesis. Since the obtained products will be applied for biological and medical studies by COST specialists, they should be free from impurities including residual metal catalyst. Therefore, in the project special attention will be paid on reaction conditions and catalyst immobilization/inclusion to design experimental procedure providing metal free products.

Requirements:

An excellent academic background. - MSc degree in organic chemistry, biotechnology (or close date of MSc thesis defence) - good knowledge of organic synthesis or biocatalysis - good knowledge of databases (Reaxys, SciFinder) - good knowledge of analytical techniques utilized in organic chemistry (NMR, MS, IR) - fluency in English.