

DESCRIPTION FOR THE GENERAL PUBLIC

The recently observed increase in the consumption of non-renewable fossil fuels and the need for management of waste materials has a significant impact on the growth of interest in the development of methods belonging to the wide group of the so-called white biotechnology. Acids and keto carboxylic acids and polyols belong to a wide group of the so-called "*green chemicals*" having a potentially wide range of practical applications in the pharmaceutical and medical industries. However, due to the complex composition of the resulting fermented solutions, the costs of obtaining fermented products are still high. It seems therefore that the design of an effective and environmentally-friendly method for the separation and concentration of low-molecular organic compounds will significantly reduce production costs and lower the market price of major fermentation products. Ultrafiltration (UF), nanofiltration (NF), classical electrolysis (ED) and bipolar electrodialysis (EDBM) are among the separation techniques widely used in the process of separation of organic compounds from the actual post fermentation broth mainly due to their pro-ecological character. Moreover, the treatment of fermentation solution using several separation techniques allows efficient cleaning of the post fermentation solution and isolation of the desirable product of satisfactory purity. The project will be implemented in several stages (purification, concentration and desalination of the post-fermentation solution using selected membrane techniques), and the obtained results will allow determination of the optimum conditions for the process and development of an effective method for the separation of the main fermentation products. All research tasks will be carried out using membrane modules available at the Department of Chemical Technology (Poznan University of Technology). Undoubtedly, the main benefits of the project will be the design of innovative and environmentally safe methods for the secretion of low-molecular organic compounds with potential medical and pharmaceutical uses from the actual post fermentation broth. The proposed method would allow reduction of the total cost of obtaining organic compounds by biotechnology, reducing the use of hazardous chemicals for environmentally, and increasing the availability of natural products that may provide the basis for dietary supplements, nutritional supplements, medicinal products, as well as can act as precursors and substrates for drug synthesis.