BIOCATALYST- CLICK CHEMISTRY DOWNSTREAMING TANDEM BASED INNOVATIVE KIT FOR OPTICALLY PURE FINE CHEMICALS SYNTHESIS

Goal of the project:

The project goal is to develop an innovative kit for efficient and cost-effective sequential continuous flow large-scale (multigram) preparation of optically pure chiral building blocks useful for synthesis of pharmaceutical compounds and agricultural chemicals, based on tailor-made immobilized lipases mediated kinetic resolution of various racemic substrates and a subsequent click chemistry like efficient down streaming of the reaction mixture.

Short description of the project

In this project a chemo-enzymatic process which integrates several innovative steps in both biocatalytic and down streaming parts will be set up. The utilization of tailor-made biocatalysts in industrial processes is an innovative approach, technically comparable to the synthetic solutions but with higher economic benefits. The use of immobilized biocatalysts-click chemistry tandem will permit to design easily scaled-up continuous flow procedures for industrial manufacturing of the target compounds, underlining the economic relevance of the proposal.

Project implemented by

- Politehnica University of Timişoara - Project leader
- University "Babes-Bolyai" Cluj Napoca - Partner 1
- Natural INGREDIENTS R&D S.R.L - Partner 2

Implementation period

01.07.2014-30.06.2016

Main activities

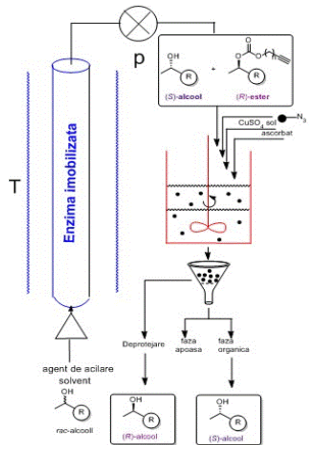
1. Preparation of various precursors: (hetero)aryl-ethanols, hydroxy- and amino acids and synthesis of various propargylic esters as O- and N-acylating agents used in enzymatic kinetic resolution (EKR).
2. Development of optimal EKR and click-chemistry type down streaming procedures.
3. Immobilization of lipases.
4. Development of the continuous flow procedure

Applicability and transferability of the results

The obtained kit, as well as the high-value products, will be marketable, but the process will be appropriate for further scaling-up, depending on the customer demands.

Financed through/by

UEFISCDI



Results

1. Multi-gram amounts of various racemic compounds and various propargylic esters as acyl donors for the EKR;
2. Enantiomeric separation protocol for previously synthesized racemates, chromatographic protocols for testing the enantioselectivity of the enzymatic reactions;
3. Scientific article submitted to an ISI quoted journal;
4. Scientific presentation, published in the abstract book of an international conference;
5. Experimental protocol of down streaming procedures;
6. Immobilization protocols and analysis procedures for tailor-made immobilized lipases;
7. Integrated EKR-click-chemistry type down streaming procedure;

Research team

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