PAL-PAM TANDEM FOR THE BIOCATALYTIC SYNTHESIS OF BOTH (*S*)- AND (*R*)-BETA-ARYLALANINES

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Abstract: Phenylalanine ammonia lyase (PAL) and phenylalanine aminomutase (PAM) are important enzymes, which catalyse the formation of α- and β-arylalanines.

These are components found in numerous bioactive compounds and natural products. PAL mediates the deamination of α-L-phenylalanine into *E*-cinnamic acid, whereas the PAM catalyses in a stereoselective manner the isomerization of α- into β-phenylalanine.[1]

In this work we used α- and β- phenylalanine as model compounds for the optimization of the processes catalyzed by these enzymes. The best results were applied for the preparation of several, optically pure β-phenylalanine analogues. Using PAL-PAM cascade, a preparative scale procedure was set up for the synthesis of enantiopure heteroaryl α- and β-alanines.

Also, we analyzed several factors that can influence the velocities of the transformation of both reaction counterparts into the other one, since in presence of PAM the equilibrium concentration of (*S*)-α-arylalanines and (*S*)-β-amino acids are around 50-

50%.

Moreover, we investigated the influence of the substrate concentration and the inhibitory effect of the acrylate on the PAM mediated biotransformations. Therefore, it can be concluded that the concentration of the substrate and acrylate have no significant influence on the conversions of the reactions.

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References

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