PAL and PAM, new biocatalysts for amino acids synthesis

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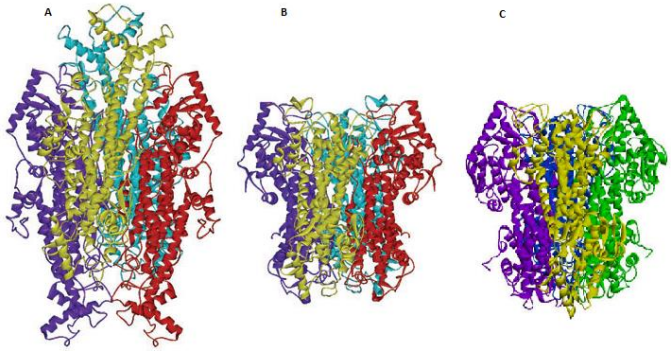
PAL and PAM are members of ammonia lyase class, catalyzing the reversible deamination of amino acids These enzymes are interesting not only by their unique mode of catalysis but also for their potential applications..

A modified PAL construct, containing the catalytic domain of the eukaryotic PAL and the C-terminal domain of a bacterial PAL, were assembled based on the considerations regarding the stability differences between eukaryotic and prokaryotic PAL (Figure 1).



A. PcPAL **B.** *P. luminiscens* PAL **C.** RxPAL (model)

Figure 1. Different type of PAL (phenylalanine ammonia lyase)

Several wild type and mutant PAL respectively PAM from various mesophiles and termophiles were cloned into the most proper hosts, followed by their expression and purification. Several unnatural substrates (Figure 2) were synthetized and tested in order to determine the general stability, activity and optimal condition for applicative purposes.
The kinetic constants (Km and Vmax) were determined and evaluated using the simplest unsubstituted derivatives as model compounds.

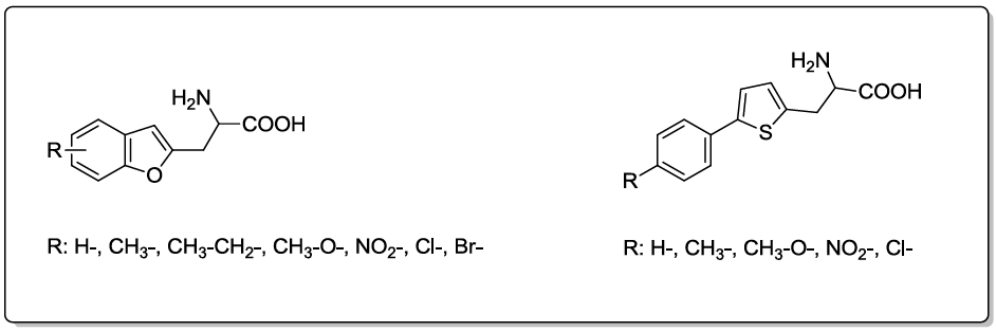


Figure 2. Substituted and unsubstituted derivatives for PAL and PAM mediated reactions

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