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Characterization of two novel (*S*)- and (*R*)-selective transaminases for the synthesis of optically active amines

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Abstract

ω-Transaminases are the most attractive biocatalysts for the synthesis of the chiral aromatic amines, highly valuable motifs for the synthesis of APIs. The driving force of an increased industrial need resulted in an emerged discovery of new Tas, at the beginning more (*S*)-selectivity TAs being characterized, while recenlty several (*R*)-selective TAs were also joining this current wave of ω-transaminase related research, herein, through data mining for novel transaminase genes, we identified the genes of *Pseudomonas psychrotolerans* TA as (*S*)-selective TA and of *Shinorizobium* sp. TA as an (*R*)-selective. The functional characterization of the novel biocatalysts hase been performed, studying their pH profile, optimal buffer choice, enzyme activity/thermal stability profile within the kinetic resolution of *rac*-phenylethylamine. The kinetic parameters of the transamination reactions, catalyzed by the novel transaminases from *Pseudomonas psychrotolerans* and *Shinorizobium* sp. of several racemic amines (*rac*-**2a, -2b, -2c, -2e**) and pyruvate (co-substrate) were compared with those of the well-known TA from *Chromobacterium violaceum*, supporting that both *Psp*TA and *Ss*TA show broad substrate tolerance and are robust biocatalysts.

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