

Biocatalytic production of biogenic amines

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Natural products are important in pharmaceutical and cosmetic industry. Some of the natural products can be cheaply synthesized by chemocatalytic methods. However, biologically synthesized chemicals are usually favored because the resulting products can be considered as “naturally derived”. Here, we developed a biocatalytic strategy for production of biogenic amines (i.e., 2-phenylethylamine, tryptamine, dopamine and serotonin) which are important neurotransmitters or a precursor of fragrance. To this end, aromatic amino acid decarboxylase (AAAD) from *Bacillus atrophaeus* was cloned and substrate specificity for L-amino acids were examined. Optimal pH for the AAAD was 8 and optimal temperature was 55 °C. Kinetic study was also performed and strong product inhibition was observed. Using whole cell reactions, 71.8 mM 2-phenylethylamine was produced from 100 mM L-phenylalanine in 38 h.