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Research article

Purification, characterization and medicinal application of tyrosinase extracted from *Saccharomyces cerevisiae*

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Abstract

Extracellular tyrosinase extracted from *Saccharomyces cerevisiae* was purified, characterized and assayed as medicinal agent. The crude enzyme activity was 7.99 U/ml and specific activity was 0.84 U/mg. The complete purification protocol was done. The final result showed one peak of pure tyrosinase with activity of 1.08 U/ml, specific activity of 2.31 U/mg, purification fold of 31.25 and recovery of 22 %. The molecular mass of the enzyme was approximately 40 KDa. Characterization of the pure enzyme indicated that the optimum enzyme concentration was 4 mg protein/ml, however, optimum substrate [tyrosine] concentration was 2.2 mg/100 ml. The k_m and V_{max} values were 2.56 mg/ml and 20 U/ml, respectively. PH 9 proved to be the optimum value, while 35 °Cwas the optimum temperature. $CuSO_4$>$MgCl_2$>$ZnSO_4$ enhanced the enzyme activity; however, $HgSO_4$ completely inhibited it. Assaying the enzyme inhibitors, declared that the metal chelating compound EDTA completely inhibited the enzyme activity which showed clearly that it is a metaloprotein. Medicinal applications of tyrosinase indicated that it exert weak antimicrobial activity against *Bacillus subtilis*, *Pseudomonas aeruginosa*, *E. coli* and *Staphylococus aureus*, but not have any antifungal activity. The enzyme proved to have antioxidant activity 50% of glutathione peroxidase. It also increased the viability of normal skin melanocyte cell line [MFB-4] before and after UV-irradiation indicated its protective and healing effect against UV-rays. The enzyme also reducing the viability of breast carcinoma cell line [MCF-7] after and before UV exposure declared that it may have anticancer activity.