Purification and Characterization of 6-Phosphogluconate Dehydrogenase Enzyme from Japanese Quail Erythrocytes

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6-Phosphogluconate dehydrogenase (EC 1.1.1.44) is the third enzyme of the pentose phosphate pathways responsible for the conversion of 6-phosphogluconic acid 6PGA to D-ribulose 5-phosphate and CO₂ in the presence of NADP⁺. In this pathway, NADPH and ribose 5-phosphate (R5P) are produced. Among these molecules, R5P is required for the synthesis of nucleotides and NADPH is required for protecting cells against oxidizing agents by producing the reduced glutathione GSH.

In this work, 6PGD was purified from Japanese quail erythrocytes with a specific activity of 52.84 EU/mg and 69% purification yield and 4984 folds by 2',5'-ADP Sepharose 4B affinity gel in a single chromatographic step. The purity was checked by SDS polyacrylamide gel electrophoresis (SDS-PAGE) method. The resulted gel showed a single band suggesting the enzyme was pure. The subunit molecular weight of the enzyme was calculated to be 81 kDa by the SDS PAGE method. In addition to these, the optimum temperature, optimum pH, KM and Vmax of the enzyme was characterised in that study.

Keywords: 6PGD, enzyme, purification, characterization.

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