

ウサギ心臓からカルボニル基還元酵素の 単離、精製とその特性

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J. Biochem., 125(1), 41-47 (1999)

Purification and Catalytic Properties of a Tetrameric Carbonyl Reductase from Rabbit Heart

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ABSTRACT An enzyme responsible for the ketone-reduction of 4-benzoylpyridine (4BP) was purified 350-fold to homogeneity from the cytosolic fraction of rabbit heart. The purified enzyme exhibited a molecular mass of 110 kDa on gel filtration, and 27 kDa on SDS-PAGE, indicating that it is a tetrameric protein composed of four identical-size subunits. Aromatic aldehydes, ketones, and menadione were effective substrates for the enzyme. Flavonoids were potent inhibitors of the enzyme, but barbiturates or pyrazole was not. Based on this substrate specificity and inhibitor sensitivity, the enzyme was taken to be a carbonyl reductase. Kinetic studies led us to conclude that the reduction of 4BP by the enzyme follows an ordered Bi Bi mechanism. The enzyme also appeared to catalyze the redox (oxidation-reduction) cycling of menadione to produce the superoxide radical. Furthermore, we provide evidence that a hydrophobic pocket, which corresponds to a straight-chain alkyl group of five carbon atoms in length, is located in the substrate-binding site of the enzyme.

抄録 ウサギ心臓からカルボニル基の還元酵素を単離、精製し、その酵素の特性について検討した。

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