

[Biochem. J., 279, 903-906 (1991)]

[Lab. of Biochemistry]

Aldehyde Reductase is a Major Protein Associated with 3-Deoxyglucosone Reductase Activity in Rat, Pig and Human Livers.TAKUSHI KANAZU, MICHIO SHINODA, TOSHIHIRO NAKAYAMA,
YOSHIHIRO DEYASHIKI, AKIRA HARA*, HIDEO SAWADA

3-Deoxyglucosone reductase activity in the extracts of rat, pig and human livers was potently inhibited by aldehyde reductase inhibitors. The major species of 3-deoxyglucosone reductase purified from human and pig livers were biochemically and immunochemically identical with aldehyde reductase. The two enzymes and rat liver aldehyde reductase exhibited higher catalytic efficiency for 3-deoxyglucosone than for D-glucuronate, a representative substrate of aldehyde reductase.

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[Lab. of Biochemistry]

Kinetic and Stereochemical Characterization of Hamster Liver 3 α -Hydroxysteroid Dehydrogenase and 3 α (17 β)-Hydroxysteroid Dehydrogenase.

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The kinetic mechanism of two kinds of hydroxysteroid dehydrogenase (HSD), purified from hamster liver cytosol, was studied. For NADP-dependent 3 α -HSD, the initial velocity and product inhibition studies indicate that the reaction follows an ordered bi bi mechanism with NADP binding to the free enzyme. Inhibition experiments and binding studies of the coenzyme and substrate are also consistent with the ordered mechanism. NAD-dependent 3 α (17 β)-HSD showed a random binding pattern of the substrates and an ordered release of product; NADH is released last. However, the two enzymes transferred the *pro-R*-hydrogen atom of NADPH to the carbonyl substrate.

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Distribution and Characterization of Dihydrodiol Dehydrogenases in Mammalian Ocular Tissues.AKIRA HARA*, TOSHIHIRO NAKAYAMA, TATSUHIRO HARADA, TAKUSHI KANAZU,
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The immunological relationship among two forms of pig lens dihydrodiol dehydrogenase (DD), aldose reductase, and aldehyde reductase has been studied. Although the minor DD (*Mr*-35K) was identical with aldose reductase, the major DD, a dimer of *Mr*-65K, was distinct from the two reductases. The two DDs were also distributed in cornea, uvea, and retina of the pig eye. In other mammals, rabbit lens exhibited much higher DD activity than did lens of mice, rats, cats, hamsters, guinea pigs and monkeys, and contained large amounts of the *Mr*-65K DD and the minor *Mr*-35K DD. In contrast, only the *Mr*-35K DD was found in lens of the other species.