[J. Biochem., 115, 493-496 (1994)] [Lab. of Biochemistry]

Stereospecificity of *Trans*-Dihydrodiol Oxidation by Dimeric and Monomeric Dihydrodiol Dehydrogenase from Mammalian Tissues.

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Dihydrodiol dehydrogenase (DD) exists in multiple forms in mammalian tiseues and catalyzes the oxidation of *trans*-dihydrodiols of aromatic hydrocarbons to the corresponding catechols. The stereochemical course in the enzymatic oxidation *trans*-dihydrodiols of benzene and naphthalene by dimeric dihydrodiol dehydrogenases was compared with that by the monomeric enzymes. The dimeric enzymes from monkey kidney, pig liver and rabbit lens selectively oxidized (−)-[1R,2R]-dihydrodiols of the aromatic hydrocarbons, whereas the monomeric enzymes from human, rat and mouse liver did the (+)-[1S,2S]-isomer, and aldehyde reductase and aldose reductase oxidized both (+)- and (−)-isomers.

[Biochem. J., 297, 195-200 (1994)] [Lab. of Biochemistry]

Purification and Characterization of a Novel Dimeric 20 α-Hydroxysteroid Dehydrogenase from *Tetrahymena Pyriformis*.

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Tetrahymena pyriformis was found to exhibit high NADPH-dependent 20-ketosteroid reductase activity that converted 17 α-hydroxyprogesterone into 17 α,20 α-dihydrodxypregn-4-en-3-one. The enzyme was purified 400-fold from the cytosolic fraction. The purified enzyme with an isoelectric point of 4.9 and Mr of 68,000 was composed of two identical subunits. The enzyme catalyzed the interconversion of the 20 keto group of 17 α-hydroxyprengnenes and the 20 α-hydroxy groups at low Km values of 2−3 μM, and exhibited carbonyl reductase and dihydrodiol dehydrogenase activities. The enzyme was inhibited by synthetic estrogens, barbiturates, aldose reductase inhibitors and quercitrin.

[Histochem. J., 26, 311-316 (1994)] [Lab. of Biochemistry]

Ultrastructual Localization of Carbonyl Reductase in Mouse Lung.

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The immunocytochemical localization of tetrameric carbonyl reductase in the mouse lung was determined by an electoronmicroscopical immunogold procedure using monospecific antibodies against the enzyme. The labelling of carbonyl reductase was observed within the mitochondria of the ciliated and non-ciliated cells of the bronchioles and the type II alveolar pneumocytes, and the density of labelling in the non-ciliated cells was higher than those in the other cells. The results clearly indicate the localization of carbonyl reductase to the mitochondrial matrix of these epithelial cells, of which the non-ciliated bronchiolar cells contained particularly high amounts of the enzyme.