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Author	高橋, 美恵(Takahashi, Mie) 本間, 浩(Honma, Hiroshi) 松井, 道夫(Matsui, Michio)
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Developmental Changes in the Isoelectric Variants of Rat Hepatic Hydroxysteroid Sulphotransferase*

Mie TAKAHASHI, Hiroshi HOMMA, and Michio MATSUI

高橋美恵, 本間 浩, 松井道夫

Major isoenzymes of androsterone-sulphating sulphotransferase (AD-ST) were isolated from liver cytosols of weanling and young adult female rats and their isoelectric properties were compared. On chromatofocusing the enzyme activity of young adults was eluted over a wider range of pH than was that of weanling rats. The activity at pH 7.8–7.2 (fraction I) is obvious at both ages, whereas the activity eluted over the pH 6.6–5.5 range (fraction II) is much lower in weanlings than in young adults. The AD-ST activities eluted in fractions I and II were separately purified by 3'-phosphoadenosine 5'-phosphate-agarose affinity chromatography at both ages. Two-dimensional gel electrophoresis of the isolated enzyme revealed several subunits with distinct pI values, but with the same molecular mass, namely 30 kDa. The relative levels of the pI 6.7 and pI 7.2 subunits are high and the relative level of the pI 6.1 is low in fraction I. In fraction II, the levels of pI 6.1 and pI 6.7 subunits are high and the level of the pI 7.2 subunit is low. There is no significant difference in the relative levels of the pI variants in each fraction between weanlings and young adults. The N-terminal amino acid sequences of the pI variants are identical within the area determined, irrespective of animal age or pI values. These results demonstrate that the pI variants of AD-ST are derived from the same precursor by post-translational modification or that they are products of closely related, but distinct genes. The pI 6.1 and 6.7 subunits presumably increased during the development from the weanling stage to adulthood, resulting in the increase in acidic form(s) of AD-ST (fraction II) in adult females.

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