

THYMINE AND URACIL CATABOLISM
IN FOETAL AND YOUNG RAT LIVER

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In regenerating liver it has been shown that the activity of thymidylate kinase is severalfold greater than that in resting liver, and that the activities of the enzymes catabolising thymine and uracil are correspondingly lower than those in the normal liver. (Canellakis et al. 1959). Hiatt and Bojarski (1960) have also shown that the activity of thymidylate kinase in foetal and neonatal rat liver is higher than in the adult rat liver, and that it falls to the adult level approx. 3-4 weeks after birth. In the course of a comparative study of the enzymic complement of tissues in foetal, young and adult animals, we have obtained some results for the enzymes concerned with the catabolism of thymine and uracil.

The rats used were the laboratory strain of Wistar rats. The rats were killed by decapitation and the livers were rapidly removed, chilled and homogenised in ice cold 0.1M phosphate buffer pH 7.4. In the case of the foetal rats, and rats under one week old, the livers from one complete litter were pooled. The adult male rats used were between 200 and 220 gms. body weight and approximately 3 months old. The pregnant female rats were between 270 and 300 gms. and were between 18 and 21 days pregnant. The enzymes were assayed in the supernatant from the homogenate after spinning at 105,000 g. for 90 mins (Canellakis 1956). The DNA determinations were carried out on the homogenate using

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the method of Burton (1956). The ^{14}C uracil and thymine samples were plated on aluminium planchets and counted in a windowless flow counter.

The results (table I) are expressed as μmoles uracil and thymine catabolised per mg DNA phosphorus for 30 mins. The figures in parenthesis indicate the number of determinations.

Table I

URACIL AND THYMINE CATABOLISM
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Age	Uracil catabolism $\mu\text{moles/mg. DNAP/30 min.}$	Thymine catabolism $\mu\text{moles/mg. DNAP/30 min.}$
Foetal	Undetectable (3)	Undetectable (3)
1-4 days	" " (3)	" " (2)
7-11 days	" " (3)	" " (3)
12-16 days	0.28; 0.63	0.18; 0.37
20-24 days	0.69; 1.05; 1.20	0.89; 0.69
25-30 days	1.72	0.79; 0.60
Adult	3.4; 5.6; 2.1	2.15; 1.94; 1.63; 1.23; 1.7; 1.87
Pregnant	1.56; 2.0	

These results are complementary to those quoted earlier in this note and indicate that the same inverse relationship holds for thymidylate kinase and the enzymes catabolising uracil and thymine in young and foetal tissues, as in regenerating liver.

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References

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