The experiments show that the submicroscopic liver cell particles are not homogeneous but are composed of subordinate proteins with different anabolic backgrounds or different rates of rebuilding.

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Synthesis of Ureidosuccinic Acid (USA) from Citrulline with Rat Liver Enzymes

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The isotope from citrulline-ureido-C^{14} is incorporated into position 2 of polynucleotide pyrimidines of the pigeon *in vivo* [1] and into orotic acid by rat liver slices [2]. It has been proposed that this incorporation takes place *via* argininosuccinic and ureidosuccinic acids (citrulline + aspartate → argininosuccinate → USA → orotate → polynucleotide pyrimidines).

With enzyme preparations from rat liver mitochondria evidence has earlier been obtained for the following reactions in the biosynthesis of USA [3]:

$NH_3 + CO_2 + ATP$ + acetylglutamate → Compound X + ADP (1)

Compound X + aspartate → USA + acetylglutamate + P_i (2)

Reaction (1) has been described by Grisolia and Cohen [4] as one step in citrulline formation, the other being:

Compound X + ornithine → Citrulline + acetylglutamate + P_i (3)

The possibility has now been investigated that USA might be formed from citrulline by a reversed reaction (3) followed by reaction (2) rather than by the proposed mechanism *via* argininosuccinate. The rat liver mitochondrial enzyme system which forms USA from aspartate, CO_2 and NH_3 was used for the investigation. The formation of labeled USA from citrulline-ureido-C^{14} could readily be demonstrated in the presence of acetylglutamate, L-aspartate and P_i. Addition of ATP and an ATP regenerating system greatly stimulated the formation of USA. It seems therefore possible that USA is formed by reactions (4) + (2)

C^{14}-citrullin e + acetylglutamate + ATP → C^{14}-compound X + ornithine + ADP (4)

rather than by a reversed reaction (3) + reaction (2).

The formation of compound X from labeled citrulline could be studied directly if aspartate was omitted from the system. Under those circumstances the CO_2 that was fixed in compound X could be released at acid pH and measured as $C^{14}O_2$. Maximal amounts of labeled CO_2 were obtained only in the presence of acetylglutamate and ATP. Significant enzymatic breakdown of C^{14}-citrulline also took place without acetylglutamate, though the presence of this compound increased $C^{14}O_2$ formation up to ten times. When arsenate was substituted for phosphate, 4—6 times more $C^{14}O_2$ was observed. The arsenate reaction was not stimulated by acetylglutamate or by ATP. It seems likely that this enzyme system contains a "citrullinase" comparable to that previously described in bacteria.

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On the Nature of the Salt Inhibition of the Phosphoribomutase Reaction

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The inhibitory effect of salts on the reaction:

Glucose-1,6-diphosphate (GDP) + Ribose-1-phosphate (R-1-P) ⇌ Ribose-1,5-diphosphate + Glucose-6-phosphate

which is catalyzed by phosphoglucomutase preparations from muscle extract has been studied. The reaction was assayed spectrophotometrically in the presence of triphosphopyridine nucleotide and an excess of Zwischenferment. Comparison of the effect of a number of different salts suggest that the inhibition is caused by anions. The influence of the concentration of R-1-P indicates that the salt inhibition can be overcome at infinitely high concentration of R-1-P. The inhibition is, therefore, probably due to competition of anions with R-1-P for the enzyme. The K_m