in the liver *via* RNA, and will be discussed within the frame of current concepts of regulatory mechanisms in the synthesis of proteins. The possibility that these hormones regulate the formation of "clusters" of secondary gene products the expression of which may, or may not, be modified by substrates or dietary manipulations, will be considered.

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Species Specificity of Amino Acyl RNA Synthetases from *E. coli* and Yeast

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Berg *et al.*[1] have reported that a methionyl RNA synthetase purified from yeast did only recognize 40 % of the methionine sites on *E. coli* amino acid acceptor RNA (acc RNA) that are available to the homologous enzyme. Benzer and Weisblum[2] using crude extracts of *E. coli* and yeast found striking differences in their ability to esterify non-homologous RNA depending on which amino acid was used. Rendi and Ochoa[3] noted that crude *E. coli* extracts could not attach leucine to yeast RNA nor could yeast extracts esterify *E. coli* RNA with this amino acid. In view of these findings it seemed of considerable interest to make a systematic study of the species specificity of amino acyl RNA synthetases with purified enzyme preparations from *E. coli* and yeast.

As part of an attempt to extend previous investigations of the nucleotide sequences in acc RNA from *E. coli*[4,5] to other microorganisms we have undertaken the purification of valyl-, leucyl-, and phenylalanyl RNA synthetases from yeast. The details of these procedures and of the purification of phenylalanyl RNA synthetase from *E. coli* will be reported elsewhere. Valyl- and leucyl-RNA synthetase from *E. coli* were prepared according to Bergmann *et. al.*[6] A comparison of the properties of the yeast enzymes and their counterparts from *E. coli* gave the following results.

All of the yeast enzymes with the exception of the leucyl RNA synthetase were able to esterify *E. coli* RNA to approximately the same extent as the *E. coli* enzymes as measured by the ratio of amino acid to RNA nucleotide. The maximal esterification of *E. coli* RNA obtained with yeast leucyl RNA synthetase was 60–70 % of the available sites. On the other hand, of the *E. coli* enzymes only the valyl RNA synthetase could esterify yeast RNA to the same extent as the homologous enzyme. The leucyl- and phenylalanyl RNA synthetases did not attach amino acids to the non-homologous RNA to a measurable extent.

Comparisons of the reaction velocities catalyzed by the enzymes with homologous RNA as compared to non-homologous RNA revealed some interesting differences. In all the cases tested the velocities with the non-homologous RNA were considerably lower. The value obtained with yeast valyl RNA synthetase and *E. coli* RNA was 10–15 % of the velocity with the "natural" substrate while the combinations yeast phenylalanyl RNA synthetase *E. coli* RNA and *E. coli* valyl RNA synthetase/yeast RNA gave only 2–6 % of the velocities with homologous RNA.

The results of analysis on the Hershey column[7,8] of amino acyl RNA's synthesized with homologous and non-homologous enzymes will be discussed.

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