not possible to demonstrate a requirement for enhanced uptake or intracellular metabolism of glucose for the stimulation by insulin of protein synthesis.

The effect on protein synthesis of experimental diabetes was studied in the hearts of rats treated with streptozotocin (Rakieten *et al.*, 1963), which produces a state of insulin deficiency uncomplicated by the toxic effect of alloxan (Mansford & Opie, 1968). No abnormality could be demonstrated in ^{14}C -labelled amino acid incorporation into protein by the perfused hearts of streptozotocin-diabetic rats or by polyribosomes prepared from non-perfused hearts. Nor did the cardiac polyribosomes from diabetic rats differ from the normal in sedimentation properties on sucrose density gradients. Similar findings have been reported for hearts from alloxan-diabetic rats, and evidence has been presented suggesting that the factor maintaining normal protein-synthetic activity in this tissue may be the elevated blood concentrations of free fatty acids found in these animals (Rannels *et al.*, 1970).

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Aminoacyl-Transfer-Ribonucleic Acid Synthetases in Myocardial Tissue

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A possible regulatory role of aminoacyl-tRNA synthetase in nucleic acid synthesis has been suggested (Neidhart, 1966). We have studied aminoacyl-tRNA synthetase in myocardial tissue (Gibson & Harris, 1972) and now report the measurement of 20 amino acid-specific aminoacyl-tRNA synthetases. Measurements of the enzymes have been made in rat, rabbit and human myocardium. The specific activities within each group and between the three species have been compared. There was a wide range of aminoacyl-tRNA synthetase activities within each species; however, there were only small differences between the three species. The lowest activities in rat and rabbit myocardium were glutamyl-RNA synthetase and aspartyl-RNA synthetase, whereas tyrosyl-RNA synthetase had the lowest activity in human myocardial tissue. The highest activity found was histidyl-tRNA synthetase. It is suggested that some of the enzymes

having low activities may possibly be implicated in regulatory processes.

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Some Physical and Kinetic Properties of Deoxycytidylate Deaminase from Normal and Virus-Infected Mammalian Cells

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dCMP deaminase (deoxycytidylate aminohydrolase, EC 3.5.4.12) was partially purified from baby-hamster kidney (BHK-21/C13) cells grown in culture, and characterized. Its properties resembled closely those of the dCMP deaminase isolated from chick embryo (Maley & Maley, 1964) and donkey spleen (Geraci *et al.*, 1967; Scarano *et al.*, 1967).

By use of the techniques of gel filtration through Sephadex G-200 and centrifugation in density gradients of sucrose, the molecular weight of the enzyme was estimated to be 122000 ± 10000 . The activity of the enzyme is activated by dCTP and inhibited by dTTP, but only in the presence of Mg^{2+} or Mn^{2+} ions. Both dCTP and dTTP behave in the system as allosteric effectors and are considered to exercise a function in controlling the intracellular concentrations of the deoxyribonucleotide precursors of DNA synthesis by their concerted action on the activity of dCMP deaminase.

In cells infected with the virus of herpes simplex, dCMP deaminase activity was increased twofold over that in non-infected cells. To demonstrate this induction effect reproducibly, the deaminase activity in the host cells was decreased by maintenance of the cells for 3–5 days before infection in medium containing low concentrations of calf serum. The induction was inhibited by actinomycin D or cycloheximide, indicating that the process required transcription and translation.

The properties of the partially purified enzyme from each system were compared. Both enzymes displayed the same general properties, but there were differences in K_m values and heat-stability. Experiments with a herpes-specific antiserum (Keir *et al.*, 1966) indicated that the enzyme preparation from infected cells might be, at least in part, viral in origin. The comparison revealed differences in five of the properties examined; although the differences were not striking when considered individually, they were considered to be definitely significant when taken together.

It was concluded that (i) the dCMP deaminase from non-infected BHK-21/C13 cells resembles closely the enzyme isolated from other animal systems, (ii) the induction of new enzyme in cells