Fractionation of Chick-Embryo Transfer Ribonucleic Acid

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The tRNA isolated from chick embryo at two stages of development was fractionated on a DEAE-Sephadex column to find the number of isoaccepting tRNA species and their variation, if any, during development. The tRNA samples were prepared from 14- and 20-day-old embryos, at which stages the tRNA content/g of tissue is the highest and the lowest respectively. They were labelled separately with three radioactive amino acids, namely arginine, leucine and serine, by using aminoacyl-tRNA synthetase prepared from chick embryo. Each of the samples was fractionated on a DEAE-Sephadex column by a salt gradient in the presence of 7.0M-urea, and the radioactivity in each fraction was measured. The tRNA from 20-day-old chick embryo, labelled with arginine, separated into two major and three minor peaks, which appeared in the early fractions. The same tRNA, when labelled with serine, gave four radioactivity peaks in the middle fractions. The tRNA from 14-day-old chick embryo, labelled with leucine, gave five radioactivity peaks, which were distributed throughout. When [^{14}C]arginine-labelled tRNA from 20-day-old embryos and [^3H]arginine-labelled tRNA from 14-day-old embryos were chromatographed together, the ^{14}C and ^3H radioactivity peaks did not coincide, showing that the isoaccepting species of arginine tRNA from the two stages of development are not identical.

An Inhibitor of Ribonucleic Acid Polymerase from *Neurospora crassa*

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The cell extract from *Neurospora crassa* grown for 9h showed the presence of an inhibitor of DNA-dependent RNA polymerase from *Escherichia coli* and *N. crassa*. Characterization of the partially purified preparation and incorporation of labelled amino acids indicated the inhibitor to be a protein. Experimental evidence showed that there was binding of the proteins to DNA, thereby blocking the template availability for transcription *in vitro* by RNA polymerase. The protein appeared to be present only at some specific growth period in the life cycle of the fungus. The significance of such a protein in the gene function of the organism will be discussed.

Thymine Starvation and Deoxyribonucleic Acid Synthesis in *Escherichia coli*

By A. K. PILGAOKAR, D. S. PRADHAN and A. SREENIVASAN (*Biochemistry and Food Technology Division, Bhabha Atomic Research Centre, Trombay, Bombay-85, India*)

It is known that in certain thymine-requiring strains of *Escherichia coli* the rate of DNA synthesis is enhanced two- to three-fold if the cells are pre-starved of thymine for about 90 min. To elucidate the events underlying this phenomenon, the rate of DNA synthesis, as determined by giving a 1min pulse of [^3H]thymine, was followed at various intervals during a synchronous cell division of *E. coli* 15T $^-$ (557). It was found that in the normal synchronous cell population, after a period at a steady rate, the DNA synthesis spurts up to three times the initial rate. When such a synchronous cell culture is starved of thymine for 90 min and then supplemented with thymine, this spurt (the magnitude of which is also three times the initial rate) is seen earlier. This implies that the increase in DNA-synthetic rate seen in a thymine-pre-starved asynchronous cell population is probably not the consequence of an increased rate of DNA synthesis per replication point. Rather the overall stimulation in DNA-synthetic rate appears to be a reflection of initiation of new replicating points occurring earlier. These results will be discussed in relation to current hypotheses on the regulation of DNA replication.

Induction of Phosvitin Synthesis in Chicken Liver by Oestrogens: Evidence for Gene Duplication

By BANSI JAILKHANI and G. P. TALWAR (*Department of Biochemistry, All India Institute of Medical Sciences, New Delhi-16, India*)

Oestrogenic hormones induce the synthesis of the egg-yolk proteins phosvitin and lipovitellin in the liver of roosters. There is a lag period of about 24h between administration of the hormone and commencement of the phosvitin synthesis. Among the relevant metabolic activities stimulated by the hormone are the following: (1) RNA synthesis is stimulated within 30min of hormone administration, reaching a maximum value at 4h; (2) the synthesis of early-phase and late-phase RNA and proteins is followed by a period during which an activation of DNA synthesis, as measured by [^3H]thymidine incorporation, is noticed. The activation, which is maximum at between 11½ and 12h, is essentially of the nuclear DNA and not that of the mitochondria. The hormone-induced activation of RNA and DNA syn-