thesis is an obligatory prerequisite for the ability of the tissue to synthesize phosphovitin. Mitomycin C, sufficient to block DNA synthesis by about 90%, when given between 6 and 11 h after oestradiol administration, inhibits phosphovitin synthesis. However, if the antibiotic is given at a time after the phase of active DNA synthesis is over no such inhibition is noticed. The possible toxicity effects of mitomycin C under the experimental conditions are excluded on the grounds that other metabolic activities of liver, including the incorporation of radioactive amino acids into proteins, are not affected by the antibiotic. Nor is there a lowering of the concentration of serum albumin, a protein synthesized by this organ.

The increase in DNA synthesis on administration of the hormone is not large enough to indicate a clonal proliferation of hormone-sensitive cells. The results are compatible with the duplication or amplification of limited genetic segments in cells, a probable mechanism by which this organ is geared by the hormone for the synthesis and excretion of a protein needed in large amounts for the manufacture of eggs.

Changes in the Ribosomal Ribonucleic Acid Content during Development of the Chick Embryo

By UMA V. RAO and J. D. CHERAYIL (*Department of Biochemistry, Indian Institute of Science, Bangalore-12, India*)

In our laboratory it has been demonstrated that the tRNA content/g of tissue in developing chick embryo does not remain constant but varies with development (Maya Sundari *et al.*, 1970). It was decided to investigate whether the rRNA content also changes with development. Fertilized eggs were incubated at 37°C, and at various days of development they were taken for isolation of RNA. The embryos were homogenized with buffer in the presence of sodium dodecyl sulphate and bentonite, and the homogenate was deproteinized by repeated treatment with phenol. The phenol layer was re-extracted with buffer for quantitative recovery of RNA. The total RNA was precipitated with ethanol and was checked for DNA contamination. The RNA was fractionated on a Sephadex G-100 column and the rRNA fraction was determined quantitatively in a spectrophotometer. It was further characterized by column chromatography on methylated albumin on kieselguhr.

The amount of rRNA/g of tissue remains constant up to day 10 of development, and then there is a rise until day 16, at which time it is almost twice the day-10 value. After day 16 there is a decrease in the rRNA content, and on day 21 it is more or less the same as that on day 10. The base compositions of the

rRNA at three stages were determined and were found to be almost identical in all cases.

Maya Sundari, R., Cherayil, J. D. & Jacob, T. M. (1970) *Abstr. Conv. Chem., Indian Institute of Technology, Madras*, p. 144

Thionucleotides in the Transfer Ribonucleic Acids of *Pseudomonas aeruginosa* and *Escherichia coli*

By Y. S. PRASADA RAO, B. THIMMAPPAYYA and J. D. CHERAYIL (*Department of Biochemistry, Indian Institute of Science, Bangalore-12, India*)

The presence of thionucleotides in the tRNA of *Pseudomonas aeruginosa* has been demonstrated in our laboratory (Thimmappayya & Cherayil, 1970). A comparison of the number and types of thionucleotides from this source was made with that of *Escherichia coli* tRNA by a column-chromatographic method. tRNA labelled with radioactive sulphur was isolated from cells grown in a synthetic medium containing [³⁵S]sulphate and was digested with alkali. The nucleotides were converted into nucleosides by treatment with excess of bacterial alkaline phosphatase and were chromatographed on a phosphocellulose column with a salt gradient. The extinction at 260 nm and the radioactivity of the fractions were determined. On the basis of the extinction at 260 nm, four peaks, identified as uridine, guanosine, adenosine and cytidine, were obtained. With *Ps. aeruginosa* tRNA the radioactivity resolved into six well-separated peaks with possibly one more minor peak. *E. coli* tRNA on the other hand gave only five radioactivity peaks. From the elution pattern it appears that all the five radioactivity peaks with *E. coli* tRNA are present with *Ps. aeruginosa* tRNA also. 4-Thiouridine and 2-thiocytidine were detected and identified in both cases by using authentic samples. 4-Thiouridine and 2-thiocytidine contained approx. 22 and 6% of the total radioactivity in *P. aeruginosa* tRNA, and were 48 and 3% respectively in *E. coli* tRNA.

Thimmappayya, B. & Cherayil, J. D. (1970) *Proc. 39th. Annu. Meet. Soc. Biol. Chem. India*, p. 5

Pyrimidine Clusters in the Deoxyribonucleic Acid of *Azotobacter vinelandii*

By S. A. KHAN, S. S. KRANDIKAR and T. M. JACOB (*Department of Biochemistry, Indian Institute of Science, Bangalore-12, India*)

Azotobacter vinelandii was grown in Burk's medium under vigorous aeration and DNA was isolated from it by a modification of Marmur's (1961)

procedure. The contaminating RNA was removed from DNA by alkali treatment. The DNA was degraded by the formic acid-diphenylamine method. The resulting purine bases and the pyrimidine mono-, oligo- and poly-nucleotides were fractionated on a Sephadex G-25 column. It was found that 4.5% of the total pyrimidine nucleotides of *A. vinelandii* DNA exist as large pyrimidine clusters.

Marmur, J. (1961) *J. Mol. Biol.* **3**, 208

Ribonucleoprotein Nature of an Organ-Specific Protein from Monkey and Goat Brain

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

An organ-specific protein isolated from goat brain by preparative electrophoresis on polyacrylamide-gel columns of the fraction left unprecipitated by 75% saturation with ammonium sulphate at pH 7.4 has been found to be a ribonucleoprotein. That this protein is a ribonucleoprotein is demonstrated by (a) the absorption spectrum, (b) shifts in the absorption characteristics of ribonuclease-treated preparation, (c) chemical tests showing the presence of ribose, purines and pyrimidines and absence of deoxyribose, sialic acid and lipids, and (d) changes in the elution characteristics on Sephadex columns of native protein after ribonuclease treatment.

Radioactive uridine and lysine given intracisternally to monkeys are incorporated in the band analogous in its properties and immunological reaction to this protein in the goat brain. The protein is rich in acidic amino acids and deficient in aromatic amino acids. The native protein from goat brain has a molecular weight of 25120, and the ribonuclease-treated residual moiety has a molecular weight of 19060 as determined by a gel-permeation procedure.

Antiserum against this protein raised in rabbits gives immunological cross-reaction with preparations from the brains of many species and also with the protein secreted by human astrocytomas in culture. On the other hand no reaction was observed with similar preparations from liver, lung, kidney, spleen,

heart and blood. Native and ribonuclease-treated preparations gave identical precipitin lines, suggesting that the antigenic determinants were present primarily on the protein moiety.

Metabolism of Myelin Lipids in the Developing Brain

By A. N. DAVISON (*Department of Neurochemistry, Institute of Neurology, Queen Square, London WC1 3BG, U.K.*)

Immediately before the onset of myelination, sterol and phospholipid cholesteryl esters are synthesized at a maximum rate, and sterol precursors appear transiently in the developing brain. The first formed myelin lamellae seem to be loosely wound about the axon and to have a lipid composition close to that of brain cytomembranes, being richer in phospholipid than cholesterol. Later, as compact myelin accumulates, the membrane acquires the characteristic lipid and protein composition of adult myelin. Thus cerebroside and basic protein are found in mature but not in 'early' myelin. It is possible to isolate a myelin-like fraction from developing brain (Agrawal *et al.*, 1970) that is postulated to be glial plasma membrane. Although previously it was considered that myelin is metabolically stable (Davison, 1970), recent evidence suggests that cholesterol molecules within the sheath may exchange with those of Schwann or oligodendroglial cells (Hedley-Whyte *et al.*, 1969; Banik & Davison, 1970; Spohn & Davison, 1971).

Agrawal, H. C., Banik, N. L., Bone, A. H., Davison, A. N., Mitchell, R. F. & Spohn, M. (1970) *Biochem. J.* **120**, 635-642

Banik, N. L. & Davison, A. N. (1971) *Biochem. J.* **122**, 751-758

Davison, A. N. (1970) in *Myelination* (Davison, A. N. & Peters, A., eds.), pp. 80-161, C. C. Thomas, Springfield

Hedley-Whyte, E. T., Rawlins, F. A., Salpeter, M. M. & Uzman, B. G. (1969) *Int. Meet. Int. Soc. Neurochem.* **2nd**, p. 212

Spohn, M. & Davison, A. N. (1971) *Int. Meet. Int. Soc. Neurochem.* **3rd**, p. 318