sharply, the increase corresponding to the decline in radioactivity in the acid-soluble fraction.

Taken in conjunction with the results described by Billing, Barbiroli & Smellie (1969), these results suggest that there are no major changes in the rate of synthesis of RNA in rat uterus until at least 6 hr. after hormone treatment and that thereafter there is a sharp increase in the rate of synthesis of RNA. These findings are consistent with the observation that the amount of RNA in rat uterus only begins to increase about 7 hr. after oestradiol treatment.

Billing, R. J., Barbiroli, B. & Smellie, R. M. S. (1969). *Biochem. J.* (accompanying abstract).

The Effect of Tri-iodothyronine on the Biosynthesis of Deoxyribonucleic Acid in *Rana catesbeiana* Tadpoles

By AILSA M. CAMPBELL and H. M. KEIR.* (*Department of Biochemistry, University of Glasgow*)

Although the metabolism of RNA in the liver of the metamorphosing tadpole has been under investigation for several years (Tata, 1967; Frieden, 1967; Nakagawa & Cohen, 1967), DNA metabolism has been less intensively studied. The total amount of DNA in tadpole liver during metamorphosis has been variously reported to decrease (Finamore & Frieden, 1960), increase (Tata, 1967) and remain constant (Paik, Metzzenberg & Cohen, 1961) at different times after the onset of the process. Champy (1922) found no change in the mitotic index of tadpole liver during metamorphosis.

Recent studies in this laboratory have shown that there is an increase in the incorporation of [³H]-thymidine into the DNA of both tadpole liver nuclei and tadpole liver mitochondria after metamorphosis is induced with tri-iodothyronine. However, the incorporation into the nuclear DNA is not evident until 5 days after the induction of metamorphosis whereas that into mitochondrial DNA is evident 1 day after the induction and reaches a maximum at 2 days after tri-iodothyronine injection. The possible causes of these alterations will be discussed.

Studies on DNA polymerase *in vitro* have been carried out with thymidine [α -³²P]triphosphate as a precursor, and several of the main characteristics of this enzyme have been determined. The incorporation appears to be limited by the high rate of breakdown of the deoxyribonucleoside triphosphates under the assay conditions. This breakdown is accelerated in liver preparations from tadpoles that have been treated with tri-iodothyronine and consequently it is possible for conditions to exist

under which changes in the polymerase activity are not observable. One of the more interesting features of the polymerase activity from tadpole liver is a strong preference for native DNA over denatured DNA as template.

Under the conditions of assay determined, the DNA polymerase activity of tadpole liver rises during the early metamorphic period. Three days after metamorphosis has been induced, this change appears to be localized in the mitochondrial and postmitochondrial fractions of the cell, the greater change being in the postmitochondrial fraction. The significance of these changes will be discussed.

Champy, C. (1922). *Arch. Morph. gén. exp.* **4**, 1.

Finamore, F. J. & Frieden, E. (1960). *J. biol. Chem.* **235**, 1751.

Frieden, E. (1967). *Recent Progr. Hormone Res.* **23**, 139.

Nakagawa, H. & Cohen, P. P. (1967). *J. biol. Chem.* **242**, 642.

Paik, W. K., Metzzenberg, R. L. & Cohen, P. P. (1961). *J. biol. Chem.* **236**, 536.

Tata, J. R. (1967). *Biochem. J.* **105**, 783.

Deoxyribonucleic Acid Polymerase from Landschütz Ascites-Tumour Cells

By CHRISTINA J. ADAMS and H. M. KEIR.* (*Department of Biochemistry, University of Glasgow*)

DNA polymerase (DNA nucleotidyltransferase, EC 2.7.7.7) from Landschütz ascites-tumour cells was partially purified to fraction 3 of the method of Shepherd & Keir (1966). Further purification removing 99% of the deoxyribonuclease (EC 3.1.4.5) was achieved by fractionation on Sephadex G-150, elution being with buffer containing bovine serum albumin (1 mg./ml.), which served to minimize enzyme denaturation. Heat-inactivation, and freezing-and-thawing experiments conducted in the presence and absence of either 25% (v/v) glycerol or DNA, showed that these agents also have a protective effect on the enzyme.

Binding of DNA polymerase (fraction 3) to DNA was investigated by sedimentation analysis through 5–25% (w/v) sucrose density gradients. Binding that occurred was dependent on the buffer and ion components in the gradient. In aqueous sucrose solutions approximately half of the enzyme bound to native DNA, forming a complex with a sedimentation rate slightly greater than that of the free enzyme. When the sucrose was dissolved in a buffer solution at low ionic strength (0.2 M-tris-HCl–5 mM-2-mercaptoethanol, pH 7.5) most of the DNA and enzyme formed a complex that sedimented to the bottom of the tube. With the inclusion of 0.15 M-KCl and 4 mM-MgSO₄ little or no binding

* Present address: Department of Biological Chemistry, Marischal College, University of Aberdeen.

* Present address: Department of Biochemistry, University of Aberdeen.