391·2 ± 76·5 nmoles/mg h, respectively, were obtained. The two results are significantly different with $P < 0.0027$, whereas no significant differences were detected in the GOT activities of both groups—the averages 50·2 ± 15·3 for animals treated with testosterone and 62·8 ± 23·7 nmoles/mg min for untreated animals. The results thus confirm the existence of a correlation between the activity of ATC and the extent of RNA synthesis, whatever the action of testosterone may be. Its mode of action may be interpreted in terms of the theory of Monod and Jacob[10] as a negative effector, but also according to Koshland[11] as a regulator of the active site of an enzyme.

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RADIOBIOLOGY

X-Radiation Sensitivity of DNA—Ability to form Specific Molecular Hybrids with Isologous *m*RNA

The basic functions of cell DNA are priming of DNA synthesis and priming of RNA synthesis. The radiation damage of the first is believed to be closely related to mutant formation and cell reproduction, and that of the second to genetic determination and regulation of intracellular metabolic processes. Recent investigations of these basic functions of DNA resulted in profound changes in the existing research practice and directed the development of radiation biochemistry of DNA from an almost purely phenomenological ground to a more causal approach. Although a relatively clear picture of cell molecular biology does exist, conflicting results are still obtained about the activity of the DNA primer, so far as its radiosensitivity against ionizing radiation is concerned.

Some authors report a negligible effect of radiation on priming activity of DNA in a DNA–polymerase system up to 10 kr. X-rays[1]. Others consider DNA synthesis to be a process that, on the contrary, is not suppressed but rather, within certain X-ray dose limits, is stimulated by ionizing radiation[2].

Recently Harrington published data showing remarkably high sensitivity to X-rays of DNA priming properties assayed by a DNA–polymerase system. A dose of 500 r. reduced the activity of the DNA to about 50 per cent[3]; the priming activity of DNA for RNA polymerase was much less affected.

We have investigated radiosensitivity of another macromolecular property of DNA, that is the ability to form genetically specified molecular hybrids with correspondent messenger RNA. We used the nitro-cellulose membrane filter technique of Nigaard and Hall[4]. Our experimental results reveal a very steep slope in the dose-response curve (Fig. 1). Obviously, "complementarity" remains unchanged for a certain increase in X-dose, until a critical point of chemical "defects' accumulation" is reached and then there is a sharp drop in hybrid formation. This brings the values of irradiated samples to those of the unhybridized controls.

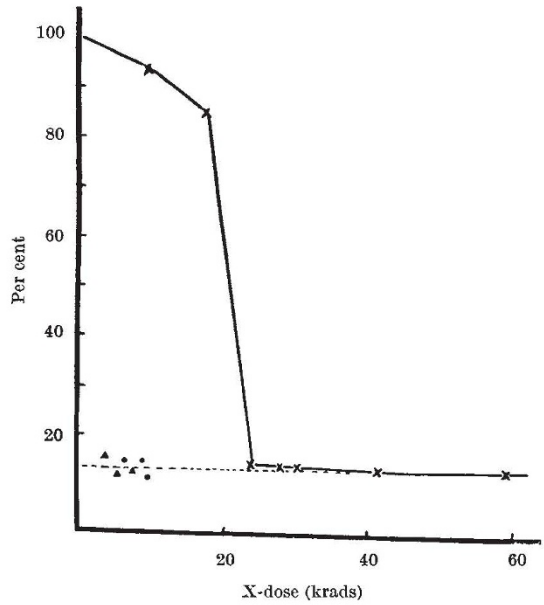

Fig. 1. Dose dependence of DNA/*m*RNA hybrid formation on X-irradiation of DNA. ×, Irradiated DNA of *E. coli* B + *m*RNA of *E. coli* B; ▲, DNA of *E. coli* B + *m*RNA of *E. coli* B (non-hybrid); ●, DNA of *B. subtilus* + *m*RNA of *E. coli* B. Double stranded DNA from *E. coli* B was irradiated in citrate buffer (*p*H 7·8) at 4° C in a concentration of 1,200 μg/ml. After irradiation the DNA samples were re-precipitated with ethanol. The hybridization experiments were performed for 210 min at 78° C according to Nigaard and Hall[4]. RNA labelled with phosphorus-32 was obtained by means of a 5 min pulse with phosphorus-32 during the exponential stage of growth. The quantitative analysis of hybrid complex formed was carried out after alkaline hydrolysis and ribonucleotide separation on 'Dowex' 1 × 8. Irradiation: 200 kV, 20 m.amp, 0·5 aluminium 600 r./min. Two controls were used for background determinations: *E. coli* DNA + *E. coli* RNA without incubation at 78° C and *E. coli* RNA + *B. subtilis* DNA with incubation at 78° C for 210 min. In both these controls no more than 15 per cent incorporation was detected.

It is tempting to assume that the nearly horizontal part of the curve corresponds to a relative reversal of DNA–*m*RNA complex formation. It may be possible from these data to determine the number of breaks in the DNA which may be sustained without affecting the genetic capacity of the DNA. Once this damage has been exceeded there would theoretically be no chance for repair because of impossibility of complementation.

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PHYSIOLOGY

In vitro Investigation of Resting Muscle Membrane Potential in Preweanling and Weanling Rat

Changes have been reported in muscle electrolytes with age[1], and several laboratories throughout the world have reported similar changes[2–5]. From birth to maturity the sodium and chloride content in a unit muscle mass decreases while the potassium increases. These changes are often interpreted as a function of increasing muscle