other factors in the seed, which may act synergistically with OX-Dapro.

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N-Methyl-*N*-Nitrosourea as a Strong Topical Carcinogen when painted on Skin of Rodents

Various nitrosamines and nitrosamides are now frequently used as carcinogens[1–3]. Investigations so far have involved oral, intravenous or subcutaneous application. We have examined the carcinogenic action of some of these substances by painting them on to the skin.

After completely negative results with diethylnitrosamine[4] on the mouse skin we obtained positive results with *N*-methyl-*N*-nitrosourea (MNU) on the same animals[5]. In this communication a strong carcinogenic action of MNU on the skin of Syrian hamsters and rats, administered by painting, is reported.

Syrian hamsters (8 weeks old) of a white line and 3- to 4-month-old white rats of the Wistar strain were treated three times a week with a freshly prepared 0·5 per cent solution of MNU in cold acetone which was painted on to the dorsal skin (interscapular region). Total MNU dose for the Syrian hamsters was about 180 mg/kg of body weight (treatment for 3–4 months), and about 520 mg/kg of body weight for 7–8 months treatment of rats.

Table 1

Animals	Duration of experiment (weeks)	Surviving animals / Tumour animals	No. of malignant skin tumours*	Earliest cancer formation (weeks)
Syrian hamsters	13	18/18	~140	8
Wistar rats	30	9/9	16	20
Albino mice	18	43/30	31	14

* Revealed by macroscopic and systematic microscopic examinations of the whole area of painted skin including microcarcinomata.

The final results of this experiment, and a comparison with an earlier experiment with albino mice (strains *AB* and XVII), are given in Table 1. Each species develops skin tumours on exposure to MNU. The shortest mean latent period, and, at the same time, the largest number of malignant skin tumours is seen in Syrian hamsters. The mouse is the next most sensitive animal, whereas the rat generally shows relatively little response to skin carcinogens. After treatment for 30 weeks, however, a 100 per cent yield of skin cancer has been achieved in the rat. Multiple and multicellularly induced epithelial tumours developed in each species, mostly from solid epithelial sprouts, which were initiated in the epidermis or the hair-follicles or, in a few cases, grew through the intermediate stage of a papilloma. The tumours include mostly hornifying and non-hornifying carcinomata, basaliomata, and single sarcomata starting from the dermis. Some adenomata of the sebaceous gland were observed in rats. Thus the results indicate that MNU can also exert a strong local carcinogenic action when painted on to the skin of different species. This action is not weaker than that of the strongest carcinogenic polycyclic hydrocarbons.

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CYTOLOGY

Mutagenic Effect of Irradiated DNA in *Drosophila melanogaster*

Earlier I reported[1,2] the mutagenic effect of irradiated DNA in *Drosophila melanogaster*. In the meantime, however, negative results have been reported by Chopra[3] and Seecof and Kaplan[4]. Khan and Alderson[5] used a chemically defined medium and, working in aseptic conditions, found that whereas calf-thymus DNA, irradiated or unirradiated, is mutagenic, the process of irradiation does not enhance the mutagenic effectiveness. These authors report that they had detected "several bunches of identical (allelic) lethals in the progeny of the individual males in both DNA experiments". They counted each bunch as a single lethal. (Here it may be remarked that it is not justified to count a bunch as a single lethal[6].) Furthermore, it is not clear whether the bunches were of different sizes and whether they appeared more often with irradiated DNA than with unirradiated DNA or otherwise.

It was therefore thought worthwhile to repeat the experiment. For the present investigation as well for the earlier one, the DNA used was fish sperm DNA, in powder form. The experimental procedure, the method of irradiation of DNA and the dose used were exactly the same as reported earlier[1], except that for the scoring of the sex-linked recessive lethals, M–5 technique (instead of C1B technique used in the earlier experiments) was used. The medium was prepared with 7 g of sugar, 7 g of bran, 6 g of maize meal, and 0·8 g of agar cooked in 100 ml. of water and 0·4 g of 'Nipagin' (*p*-hydroxybenzoicaoid-methylester) dissolved in alcohol and added to it as fungicide. The medium did not contain yeast and was not seeded with fresh yeast. The irradiated DNA (soon after the irradiation) was added to the medium when at about 80°–85° C, well stirred, cooled and the culture was initiated with fifteen to twenty pairs of flies of the Ore–R strain (in-bred for generations in our laboratory). After about 12 days the parent flies were discarded. 0–2 days old males, which had developed as larvae on the food containing DNA (irradiated and non-irradiated), were individually mated to three virgin females from the Edinburgh dual-purpose stock, left together for about 12 days and then discarded. Ten to fifteen *X*-chromosomes in each male were checked for the presence of sex-linked recessive lethals.