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Induction of Ovarian Tumours with 9 : 10-Dimethyl-1 : 2-Benzanthracene

MAMMARY carcinoma can be readily induced in certain strains of mice by treatment with 20-methylcholanthrene. In the course of experiments intended to investigate whether other members of the same group of carcinogenic hydrocarbons are also effective on the breast, an incidental finding has been made that treatment with 9 : 10-dimethyl-1 : 2-benzanthracene leads to the appearance of ovarian tumours.

Female mice of the Bonser *IF* strain were treated with 0·5 per cent 9 : 10-dimethyl-1 : 2-benzanthracene in olive oil by the technique previously described[1]. After a small pilot series to determine dosage, the first batch consisted of thirty animals, of which eight other mice survived when the first ovarian tumour was observed after 238 days; of these, one further mouse revealed a macroscopic ovarian tumour and others showed microscopical abnormalities. In a second series of twenty-nine animals, the first ovarian tumour was found at 196 days, when there were twenty-two survivors. Of these, nine were afterwards found to have macroscopic ovarian tumours, and four showed early tumours histologically. Of the total thirty-one mice 'at risk', there were therefore macroscopic tumours in eleven (35 per cent), and the total tumours found were fifteen (48 per cent).

The macroscopic tumours were 0·5–1 cm. in diameter, bright yellow in colour and sometimes hæmorrhagic. Histologically, they were all of obviously granulosa-celled origin. Apart from the tumours, all the ovaries of mice surviving to tumour age showed histological abnormalities. One of the tumours has been successfully transplanted. It retains its histological differentiation. Some at least of the tumours appear to function œstrogenically, as estimated by vaginal smears; the non-tumour-bearing animals tested have, on the other hand, been in continuous di-œstrus. Most of the animals, including all those with ovarian tumours, have also showed breast carcinomata. There is a suggestion that the average number of breasts affected is greater in the ovarian-tumour mice than in the others.

Ovarian tumours have not been obtained in *C57* black mice with 9 : 10-dimethyl-1 : 2-benzanthracene. It has been confirmed by *ad hoc* experimentation that methylcholanthrene does not give ovarian tumours in the *IF* strain, and does not lead to histological abnormalities of the extent found following dimethylbenzanthracene treatment.

Further work is in progress before the results are published in detail, but we feel justified at this stage in directing attention to what must be regarded as an important qualitative difference in the biological action of two carcinogens belonging to the same general group of cyclic hydrocarbons.

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Influence of the Thyroid upon the Survival-Rate of Guinea Pigs treated with X-Rays

IT has been shown that the lesions of the thymus induced by X-rays are restored more quickly in thyroidectomized guinea pigs than in normal animals. This supported the supposition that (to a certain extent) disorders induced by X-rays may be dependent upon the thyroid.

The influence of X-ray irradiation upon the thyroid is still under discussion[1]. This is understandable, since it can be shown that lethal irradiation does not induce any sign of thyroid stimulation in rats, whereas signs of thyroid stimulation are observed after a non-lethal dose of radiation[2].

A total of 46 male guinea pigs of average weight 200 ± 15 gm. were irradiated and divided into three groups: (1) 15 thyroidectomized animals; (2) 16 thyroidectomized animals, which received every second day injections of 6γ thyroxin per 100 gm. (this is sufficient to prevent the thymus atrophy determined by thyroid extirpation[3]); (3) 15 normal controls.

The animals were irradiated under the following conditions: one single total irradiation of 800 r., given with a Siemens–Halske apparatus, 160 kV., 10 m.amp., target distance 50 cm., field 20 cm. × 24 cm., 1 mm. copper filter. Thyroidectomized animals were irradiated fifteen days after the operation. The survival-rate of these animals is shown in Table 1.

Table 1. SURVIVAL-RATE OF GUINEA PIGS FOLLOWING A SINGLE TOTAL X-RAY IRRADIATION OF 800 R.

Days after irradiation	Survival-rate		
	Normal	Thyroid-ectomized	Thyroidectomized and injected with thyroxin (6 γ per 100 gm. and 48 hr.)
0	15	15	16
8	15	15	16
9	13	14	15
10	11	10	13
11	8	8	8
12	6	5	6
13	5	4	5
14	4	4	4
15	3	3	3
18	3	3	3
30	3	3	3