Abstracts

Reports of Research


A total of 267 rats from 15 different strains were injected in the axilla with 0.8 to 4.0 mgm. of 1,2,5,6-dibenzanthracene, 3,4 benzpyrene, or methylcholanthrene, dissolved in olive oil. Regardless of strain, the tumors (sarcomas) developed sooner in males than in females. This is thought to be associated with the more rapid growth rate of the males. In addition there were differences in rate of tumor development among the different strains, ascribed tentatively to differences in genetic constitution. For example, tumors developed much more slowly in gray Norway rats than in Wistar albinos, King inbred albinos, or other strains. Another difference was found between the Wistar albinos and the King inbred albinos. In the King rats sarcomas induced in the subcutaneous tissue were accompanied by pulmonary neoplasms, while in the Wistar rats there were tumors only at the injection site and none in the lungs.—R. B.


Piebald rats received with their food 4 mgm. of 2-acetylaminofluorene daily for 25 weeks, and were examined before the 175th day. The differences between the 2 strains may be tabulated as follows:

<table>
<thead>
<tr>
<th>Tumor</th>
<th>Wistar</th>
<th>Piebald</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epithelioma, ductus acousticus externus</td>
<td>much more frequent</td>
<td></td>
</tr>
<tr>
<td>Mammary cancer in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over 60%</td>
<td>1/25*</td>
<td></td>
</tr>
<tr>
<td>Tumors of small intestine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 of 133</td>
<td>11 of 166</td>
<td>over 50%</td>
</tr>
<tr>
<td>Carcinoma of colon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14/300*</td>
<td>2/38*</td>
<td></td>
</tr>
</tbody>
</table>

* Number of animals with tumors/number of animals observed.

The histology of the intestinal tumors is described and illustrated. The author does not compare the incidence of liver tumors in the 2 strains and does not state the incidence of intestinal tumors upon untreated piebald rats.—E.L.K.


Benzpyrene when injected into or painted on mice is converted in vivo to metabolic products (X1 and X2) distinguishable from the hydrocarbon by differences in fluorosence, absorption spectra, and solubility. X1 is also formed in vitro by allowing mouse blood, liver, lung or kidney, or human blood, to act on suspensions of benzpyrene. X2 is formed in vitro by incubating mouse skin with benzpyrene which had been painted on after removal of the skin from the animal. The in vivo and in vitro products appear to be identical.—I. H.


When albino rats were fed with a diet containing 0.13% of ethyl urethane, 39% developed pulmonary adenomas between 9 and 15 months after the experiment was started. One animal out of 57 showed an incipient hepatoma. Thirty injections of 0.1 mgm. of urethane each caused lung adenomas in 7% of the treated animals while 25% developed hepatomas. An additional intravenous injection of 2 mgm. of methylcholanthrene did not alter this result. It is concluded that the chronic therapeutic use of urethane in human beings may be harmful.—Author's abstract.


Six groups of rats were treated with p-dimethylaminobenzene, methylcholanthrene or ethyl urethane alone, or with a combination of the azo dye and one of the 2 other carcinogens. The number of specific tumors resulting from the combined treatment never exceeded significantly that observed after the treatment with one carcinogen alone. A comparison of the calculated and observed numbers of animals bearing hepatomas and other tumors at the same time showed no significant difference. There was apparently no mutual influence of 2 carcinogenic agents applied at the same time under the experimental conditions employed.—Author's abstract.


The relationship between the development of local tumors and pulmonary adenomas in albino mice of a non-inbred strain, which had received a single subcutaneous or intraperitoneal injection of methylcholanthrene, was studied. No significant difference was found between the control and experimental animals regarding the occurrence of both types of these tumors. It is concluded that a non-specific factor, which has been proposed to exist by other authors influencing tumor development, is not necessarily detectable in any strain of mice.—Author's abstract.

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The production of liver tumors in rats by 2-aminofluorene and 2-acetylaminofluorene is not affected by the addition of liver extract to the diet or by variation in casein and riboflavin content of the diet. These compounds produce tumors in a wide variety of locations, the site of tumor development apparently depending upon the genetic constitution as well as upon the sex of the rats employed.—Author’s abstracts.


Two series of experiments were carried out. (1) Seven young mice of the RIII strain (4 females and 3 males) were gonadectomized when they were 2 months old. Six of these were inoculated subcutaneously with a suspension from a pregnant cow was injected subcutaneously to 40 days). One week after the castration, hypophyseal extract from strain RIII were gonadeetomized at various ages (26 to 133 days). (2) Fifteen mice, young female mice. But even in these cases the carinalucule do not have the special characteristics of proliferation of the acini which are visible in mice of a cancerous strain.—R. J.


Solutions of adrenaline which have been enzymatically oxidized show a polarographic wave which belongs to the oxidation product of adrenaline, i.e., adrenochrome. The reversibility of the adrenochrome-redox system has been polarographically examined and the half-wave potentials at different pH levels corresponding to the redox potentials have been estimated. According to this the redox potential of adrenochrome at pH 7.0 and 20° C. is + 0.044 of a volt against a normal hydrogen electrode. It was observed that the leukostase of adrenochrome was unstable; its decomposition has been followed at different pH values and temperatures. During the reduction with hydrosulfite and hydrazine 2 new cathode waves were observed. In acid solutions the halfwave potential of adrenochrome became negative with the increase of its concentration, although this process seemed to be reversible. An attempt was made to explain this change as a result of dimerization of the oxidized form.—B.S.


Promizone (4,2-diaminophenyl-5-thiazolyl sulfone) appears to exert its goiter-stimulating effect by preventing the synthesis of thyroxin by thyroid cell, thereby permitting an increased elaboration of the thyroid stimulating hormone by the anterior pituitary lobe. The administration of small amounts of thyroxin daily, during the time that the promizole was provided, neutralized the activity of the goitrogen and preserved the thyroid glands in a normal state.—M. T.


This article describes the use of the Sharples supercentrifuge in the preliminary concentration of papilloma virus from large volumes (2 liters) of crude extract. The vacuum type of ultra centrifuge was employed for further concentration and purification.—H.J.C.


Data, calculations and interpretations are recorded and compared with previous work.—H. J. C.


Three new variants in ducks of the Rous sarcoma of chickens were obtained. Because they showed characteristics different from those of the variants previously studied, the strains are described in some detail. The most important difference was that the viruses of the strains here studied, despite becoming adapted to ducks, did not lose their affinity for their original host, the chicken. Also, the tissue affinities of the viruses, the amount of collagen in the tumors, and the reaction of bones of chicks to periosteal and endosteal tumors were different. The virus of one of the variants, strain 14(d), was of special interest for the following reasons: (1) because after infecting adult chickens it lost its acquired affinity for ducks and reverted to a chicken tumor type; (2) because it induced malignant tumors in pigeons of all ages; and (3) because it showed an affinity for the central nervous system of young ducks in which system it induced typical lesions.—Author’s abstract.


Suspensions of tumor cells of 2 duck variants of the Rous sarcoma and another duck tumor of uncertain origin injected into the breast of pigeons several months old produced local growths never followed by generalization, whereas tumor cells from another variant induced even in pigeons 12 months old large local growths often followed by generalized metastases and causing death of the host in a few weeks. These tumors have been maintained in 2 or 3 successive passages through pigeons.—Author’s abstract.

The author points out certain facts and uncertainties that argue against adopting the suggestion of Hammett (Science, 103:714. 1946) that women with a family history of breast cancer should not nurse their children.

R. B.


A dba mouse mammary carcinoma has been cultivated continuously in eggs for 2 years and 7 months, comprising 80 transplant generations. During that period there has been no observable change in the tumor histology. The stroma of these tumors is made up of chick tissue. Transplants of this egg-grown carcinomatous tissue in mice frequently resulted in the growth of mixed carcinoma-sarcomas.

In a series of 186 experiments involving the use of 2,440 mice, it was found that 38% of the tumors from the first transplant generation in mice contained sarcomatous tissue. Subsequent generations of mouse transplants showed stromal malignancy in 52 to 75% of the experiments. The original mammary carcinoma was completely replaced by sarcomatous tissue in 11 of the 186 experiments. The sarcomas produced in this manner were of several cell origins and had varying growth rates and cytological characteristics. Many contained giant cells, nuclear debris and unusual mitotic aberrations. When egg-grown tumor tissue is implanted back into the mouse, the stroma of the resulting tumor is composed of mouse tissue. It is concluded that the induction of malignancy in the normal cells of the stroma is due to contiguity with the cancer cells of the implant and consequent infection with the tumor agent or virus. The process is considered to be essentially the same as that involved in the production of malignant tumors by injection into the mouse of cell-free extracts of materials from tumor-bearing eggs.—Authors' abstract.


Diethylene glycol at concentrations of 1, 2, and 4% in the diet of Osborne-Mendel rats (12 per group) for 2 years produced toxic effects. Similar doses of triethylene glycol produced no toxic effect. Diethylene glycol retarded the growth rate of rats considerably at the high concentration but was statistically significant only during the fast growing period at the 2 lower concentrations.

At the dosage levels used neither compound affected food consumption. Diethylene glycol produced lesions in the lower urinary tract related in extent to dosage. Bladder stones of calcium oxalate occurred in all except 1 rat on the 4% concentration, and in lesser numbers in those on the lower concentrations. Bladder tumors occurred in about half of the rats on the 4% and 2% concentration, and in none of the 1% concentration. The tumors were papillary, benign, and intramural. In some cases they showed varying degrees of malignancy. Kidney lesions at the 4% dietary level of diethylene glycol were moderate to marked, at 2% slight to moderate and at 1% slight or absent.

Hepatic lesions paralleled the dosage of diethylene glycol with a moderate amount of damage at 4%, a small amount at 2%, and almost none at 1%. Very little liver damage was visible grossly.

From this and other work the authors conclude that in the ethylene glycol series the chronic oral toxicity to rats decreases with an increase in molecular weight of the glycols.—F. L. H.


The author reviews techniques and applications of methods for histological demonstration of enzymes by routine laboratory procedures. It is concluded that the importance of these reactions lies not alone in their diagnostic use but also in the fact that they may open up a new avenue of research in experimental pathology.—S. H. D.


The content of certain vitamins in mouse epidermis following painting with methylcholanthrene in benzene solution was studied by bioassays using mutant strains of Neurospora. The levels of inositol, choline and p-aminobenzoic acid did not change significantly but the biotin content rapidly decreased to about 60% of normal. There was a slight increase in the pyridoxine content after treatment with the carcinogen and with benzene alone.—H. J. C.


This is a plea for a coordinated, large scale, government-supported attack on the cancer problem.—R. B.