

Abstracts

Reports of Research

The Ultraviolet Absorption Spectra of Aromatic Hydrocarbons. JONES, R. N. [Harvard Univ., Cambridge, Mass.] *Chem. Revs.*, 32:1-46. 1943.

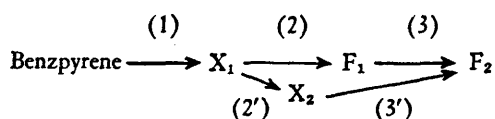
The ultraviolet absorption spectrum is of considerable value in the determination of the structure of aromatic hydrocarbons, including the carcinogens. The literature on this subject is reviewed, with 263 references, and 8 tables provide separate bibliographies of articles giving absorption spectrum data on each of 370 hydrocarbons.—M. H. P.

The Biochemistry of Benzpyrene. I. A Survey, and New Methods of Analysis. WEIGERT, F., and MOTTRAM, J. C. [Mt. Vernon Hosp. and Radium Inst., Northwood, Middlesex, England] *Cancer Research*, 6:97-108. 1946.

After a review of existing knowledge of the metabolism of benzpyrene, methods are described for the separation, purification, identification, and estimation of 4 different products of the metabolic conversion. These products are designated by the symbols X_1 , X_2 , F_1 , and F_2 , and some of their properties are described.—Authors' summary.

The Biochemistry of Benzpyrene. II. The Course of Its Metabolism and the Chemical Nature of the Metabolites. WEIGERT, F., and MOTTRAM, J. C. [Mt. Vernon Hosp. and Radium Inst., Northwood, Middlesex, England] *Cancer Research*, 6:109-120. 1946.

The metabolic conversion of 3,4-benzpyrene in mice passes through a number of stages, symbolized by X_1 , X_2 , F_1 , and F_2 according to the following sequence:



The various metabolites are characterized by their fluorescence and absorption spectra and by their chemical chromatographic properties, which suggest their chemical constitutions.

The derivatives

$X_1 = 8(\text{OR}_1)-9(\text{OH})-8,9\text{-dihydro-3,4-benzpyrene}$

$X_2 = 8(\text{OR}_1)-9(\text{OR}_2)-8,9\text{-dihydro-3,4-benzpyrene}$

and $F_1 = 8(\text{OR}_1)-3,4\text{-benzpyrene}$

have not been described previously, whereas F_2 is the known end product of the metabolism, 8-hydroxy-3,4-benzpyrene. After an intravenous inoculation of a finely dispersed colloid, the metabolism of 3,4-benzpyrene follows the sequence above in an approximately quantitative manner. The nature of the radicals R_1 and R_2 is not yet established, but they are derived from the structure of the cells with which the parent hydrocarbon and X_1 come

into contact. The steps (1) and (2') occur *in vivo* only, whereas (2) can be reproduced *in vitro* by a mild chemical reaction at room temperature, and (3) and (3') by stronger agents at elevated temperature.—Authors' summary.

Effects of Massive Doses of Methylcholanthrene on Epidermal Carcinogenesis. STOWELL, R. E., and MÁAS, L. C. [Washington Univ. Sch. of Med., St. Louis, Mo.] *Cancer Research*, 6:121-127. 1946.

Three groups of approximately 50 Swiss mice each were painted on the back with solutions of 1.0% methylcholanthrene 3, 6, and 9 times a week, while 2 other groups were used as unpainted controls and controls painted with pure benzene. Such tremendous amounts of methylcholanthrene produced malignant tumors a little more rapidly than smaller doses. As systemic effects of exposure to the methylcholanthrene the mice showed increased incidences of (a) inflammation in the liver, kidney, and lungs; (b) hyperplasia of the bone marrow, spleen, and lymph nodes with extramedullary myelopoiesis, lymphopoiesis and erythropoiesis; and (c) leukemia. It is not known whether these changes were brought about directly by the methylcholanthrene and its detoxification products, or indirectly through lowered resistance of the host to bacterial or viral agents. These results do not conclusively support either the theory that chemical carcinogens act directly by stimulating uncontrolled cell proliferation; or by a toxic action from which some surviving cells escape by adopting abnormal growth characteristics.

Some thyroid glands had atypical acini and some parathyroids were hypertrophic and hyperplastic. These experiments do not support the idea that such changes are primarily caused by the methylcholanthrene.—Authors' summary.

Calcium and Potassium Content of Secretions from Noncancerous and Cancerous Stomachs. DUNHAM, L. J., and BRUNSCHWIG, A. [Univ. of Chicago, Chicago, Ill.] *Cancer Research*, 6:54-56. 1946.

Calcium determinations were carried out on juices from 14 patients with gastric tumors (10 carcinomas and 4 lymphosarcomas) and from 24 control patients. Differences in calcium could be explained on the basis of the higher acidity in the juices from control stomachs. Potassium determinations were carried out on the juices of 9 patients with gastric tumors (7 carcinomas, 2 lymphoblastomas) and of 11 control patients; no significant differences in the amounts secreted were observed. The secretion of both calcium and potassium was increased, compared with controls, in the juices of 5 patients with

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achlorhydria induced by the x-ray treatment of duodenal ulcer.

The calcium and potassium concentration of gastric juice from cancerous stomachs is not characteristic. These negative findings are in contrast to significant differences observed between nonneoplastic and neoplastic gastric (and colon) mucosa, which will be described subsequently.—Authors' summary.

Isolation of Steroids from the Urine of Patients with Adrenal Cortical Tumors and Adrenal Cortical Hyperplasia, A New 17-Ketosteroid, Androstane-3(α),11-diol-17-one. MASON, H. L., and KEPLER, E. J. [Mayo Foundation and Clin., Rochester, Minn.] *J. Biol. Chem.*, **161**:235-237. 1945.

A new steroid, androstane-3(α),11-diol-17-one, as well as several previously reported steroids, was isolated from the urine of 3 women with adrenal cortical tumors and from the urine of 4 patients with bilateral cortical hyperplasia.—H. J. C.

The Isolation of Pregnenediol-3 α ,17-one-20 from Human Urine. LIEBERMAN, S., and DOBRINER, K. [Memorial Hosp., New York, N. Y.] *J. Biol. Chem.*, **161**:269-278. 1945.

A new steroid, pregnenediol-3 α ,17-one-20, m. 219-219.5° C., considered to be a product either of an abnormal activity of the adrenal gland or of an abnormal metabolism of steroids of adrenal origin, has been isolated from the urine of a woman with adrenal hyperplasia, a woman with an adrenal tumor, a cryptorchid male, and a eunuroid male injected with testosterone. This compound has not been found in the urine of normal individuals or of pregnant women.—H. J. C.

Betel Chewing Among Natives of the Southwest Pacific Islands. Lack of Carcinogenic Action. EISEN, M. J. [Med. Corps, A. U. S.] *Cancer Research*, **6**:139-141. 1946.

Betel chewing by the natives of New Guinea, New Britain, New Ireland, and the adjacent smaller islands does not appear to elicit cancer of the mouth.—Author's summary.

Intraperitoneal Sarcomas Produced in Mice with Mouse Ascitic Fluid. HERLY, L. [Coll. of Physicians and Surgeons, Columbia Univ., New York, N. Y.] *Cancer Research*, **6**:131-133. 1946.

Paraffin pellets containing 1 mgm. of methylcholanthrene, when introduced into the abdominal cavity of young adult male C57 mice, produced ascites in 50 days and sarcomas in all mice surviving for 90 days. The ascitic fluid, even when obtained before the development of sarcomas, produced ascites and malignant tumors when injected intra-abdominally into another series of mice of the same strain. The ascitic fluid obtained from this second series, when injected intra-abdominally into a third series of mice, again resulted in ascites and sarcomas. These tumors were transplantable by subcutaneous inoculation. Whatever the active agent may have been, it was destroyed by ether and by exposure to 90° C.—Author's summary.

Conjugated Forms of Myelokentric and Lymphokentric Acids. TURNER, D. L., and MILLER, F. R. [Jefferson Med. Coll., Philadelphia, Pa.] *J. Biol. Chem.*, **161**:91-97. 1945.

Myelokentric and lymphokentric acids, present in the

urine of patients with leukemia, occur as the prosthetic groups of water-soluble conjugates. These conjugates, when administered separately to guinea pigs, produced myeloid and lymphoid lesions, respectively, and a mixture of them both produced lesions of the "Hodgkin's type."—H. J. C.

Attempted Transmission of Human Leucemia in Man. THIERSCHE, J. B. [Inst. of Med. and Vet. Sc., Adelaide, South Australia] *J. Lab. & Clin. Med.*, **30**:866-874. 1945.

The results were negative in numerous attempts to transfer human leukemias by injecting suspensions of leukemic cells derived from the blood, spleen, and lymph nodes of patients with chronic and acute myeloid and lymphatic leukemias into the subcutaneous tissues of other patients suffering from incurable diseases (cancer, heart disease) with a life prospect of less than 2 years. Results were negative also in attempts, made with whole blood, to cross-transmit chronic myeloid leukemia to patients with chronic lymphatic leukemia, and *vice versa*. The results are consistent with previous negative findings on the transmissibility of human leukemia, but the author suggests that more suitable recipients or a different technic might yield positive results.—J. G. K.

The Effects of Crude and Purified Penicillin on Continuous Cultures of Normal and Malignant Cells. GEY, G. O., GEY, M. K., INUI, F., and VEDDER, H. [Johns Hopkins Univ. and Hosp., Baltimore, Md.] *Bull. Johns Hopkins Hosp.*, **77**:116-131. 1945.

Continuous cultures of normal (rat) and tumor (human, rabbit, and rat) [carcinoma and sarcoma] cells maintained in roller tubes as pure strains tolerate very high concentrations of penicillin sodium (Merck) for long periods of time. The results indicate that it is possible to cultivate almost indefinitely strains of cells in plasma culture media whose supernatant fluid contains penicillin sodium in concentrations of 5,000 Oxford units per cc. Such successful cultivation apparently depends upon the character of the immediate cultural environment as well as the inherent tolerance of the cell strain. No conclusive evidence of an increased tumor cell susceptibility to purified penicillin when compared to normal cells is justified from the results obtained on continuous cultures and on primary explants of tumors produced by inoculating continuous cultures of tumor cells into animals. The toxicity of crude penicillin filtrate is much greater than that of the therapeutic penicillin sodium and is perhaps due in large part to the toxicity of the mold medium from which the filtrate is made.—Authors' summary. (J. G. K.)

Neutralization of Inhibition of Tumor Growth. KERESZTESY, J. C., LASZLO, D., and LEUCHTENBERGER, C. [Merck and Co., Inc., Rahway, N. J., and Mt. Sinai Hosp., New York, N. Y.] *Cancer Research*, **6**:128-130. 1946.

By adapting a method that detects inhibitors of tumor growth it is possible to demonstrate that the action of inhibitors upon sarcoma 180 in mice can be effectively neutralized by both structurally related and unrelated substances. Neutralization by approximately equal amounts of inhibitor and antagonist was observed in the inositol-*p*-aminobenzoic acid, inositol-pyridoxine, and *d*-desthiobiotin-*d*-biotin experiments. Thiamin, niacinamide, *o*- and *m*-aminobenzoic acid, and leucopterin were slightly

active, if at all, in counteracting the inhibition caused by inositol. Interference could be detected when larger doses of some of these substances were given. While both *d*-desthiobiotin and an avidin concentrate were effective inhibitors of tumor growth, neutralization occurred when these two materials were tested for antagonism. Impurities in the avidin concentrate may be responsible for this interference.—Authors' abstract.

Histologic Changes in the Central Vegetative Centers of the Hypothalamus in Carcinoma as an Indication of Vegetative Functional Disturbances. MORGAN, L. O. [Univ. of Cincinnati Coll. of Med., Cincinnati, Ohio] *Cancer Research*, 6:142-147. 1946.

A histologic study was made of 5 nuclei of the hypothalamus in 19 patients with carcinoma of various organs. Extensive chromatolysis and cell destruction indicate that all these cell groups are involved in carcinoma. The pattern of these cell changes shows a wide range of variation. A congenital overdevelopment of some of the nuclei was indicated. The cell destruction that occurs in carcinoma makes it impossible to evaluate this factor properly. The 5 nuclei studied are regarded as constituting a central mechanism for the control and integration of vegetative functions. This control is mediated largely through the autonomic and endocrine systems and influences most if not all metabolic functions. The cell changes in the hypothalamus suggest a widespread but variable instability or irregularity of vegetative functions

in the patient with carcinoma. This is in keeping with the finding of numerous investigators who have made functional studies in experimental animals or in cancer patients.—Author's abstract.

Melanosarcoma and Rhabdomyoma in Two Pine Snakes (*Pituophis melanoleucus*). BALL, H. A. [Biol. Research Inst. of San Diego Zool. Soc., and San Diego Co. Gen. Hosp., San Diego, Calif.] *Cancer Research*, 6:134-138. 1946.

Malignant melanomas occurring in a male and female pine snake are reported. The primary tumor in the female snake arose at the margin of one of the large pigmented areas of the skin of the tail. Metastatic tumors were found in the liver and the celomic cavity. In the male snake 2 large melanomas occurred on the upper lip, and another tumor, a typical rhabdomyoma, sprang from the hard palate. These tumors appear to be the third or fourth instances on record of malignant neoplasms in snakes.—Author's abstract.

Biochemical Genetics. BEADLE, G. W. [Sch. of Biol. Sc., Stanford Univ., Calif.] *Chem. Revs.*, 37:15-96. 1945.

This review, with 354 references, discusses the evolution, structure, and action of genes, the characters controlled by genes (including cancer), the chemical nature of chromosomes and genes, spontaneous and induced gene mutation, and viruses and plasmagenes. Five pages are devoted to the relationship between genes and cancer.—M. H. P.

Clinical and Pathological Reports

Clinical investigations are sometimes included under Reports of Research

HEREDITY

Tumors in One of Homologous Twins. Hodgkin's Disease with Primary Skeletal Manifestations. CHARACHE, H. [Brooklyn Cancer Inst., Brooklyn, N. Y.] *Am. J. Roentgenol.*, 54:179-181. 1945.

This is a report of Hodgkin's disease in one of homologous twins, who died at 5 years of age. The surviving twin was apparently normal $4\frac{3}{4}$ years after the onset of symptoms in the deceased twin.—E. H. Q.

RADIATION

Skin and Lip Cancer. SLOBODIN, H. [Vet. Admin., Hines, Ill.] Report to Chicago Roentgen Soc., Apr. 12, 1945. From abstr. in *Proc. Inst. Med. Chicago*, 15:361-362. 1945.

Fractionated roentgen ray treatment, usually completed in less than 3 weeks, was successful in 225 skin carcinomas except for 3 recurrences, 2 irradiation ulcers, and 2 lesions that required supplementary surgery. Of the 3 recurrences, 2 were presumably controlled by subsequent surgery, and 1 patient died of extensive squamous carcinoma of the neck. Treatment was successful in all carcinomas about the eye and ear. In a series of 81 patients with carcinoma of the lip similarly treated, none showed local recurrence 2 years later, 3 developed cervical metastases, and 2 developed irradiation ulcers, which healed promptly. Of 6 patients with carcinoma of the lip treated surgically, none

had local recurrences; 1 had extensive recurrent cervical metastases after neck dissection.—M. E. H.

The Response to Preoperative Irradiation as a Clue to the Management of Breast Cancer. LEVI, L. M. [Los Angeles Co. Hosp., Los Angeles, Calif.] *Am. J. Surg.*, 68:355-357. 1945.

One hundred and thirty-one patients with breast carcinoma were treated with x-ray irradiation. Fifty-three showed conspicuous regression in the size of the mass, and of these, 29 were then subjected to radical mastectomy with a survival rate of 45%. In the remainder of the group in which the tumor regressed following x-ray but surgery was not employed, the survival rate was 56%. No consistent correlation was found between the histologic appearance and the response of the tumor to radiation. The results indicate that in highly radiosensitive breast tumors, irradiation alone delays metastasis, while subsequent surgery is prone to disseminate the disease: the average time after treatment to the appearance of metastasis was 16.22 and 10.77 months, respectively.—W. A. B.

NERVOUS SYSTEM

Glioma of the Optic Chiasma. MINTON, J. *Proc. Roy. Soc. Med.*, 38:566. 1945.

Description of a case.—E. L. K.