Comments and Communications

The Formation of Malignant Tumors in Mice by Deuteron-bombarded Methylcholanthrene

As part of a more general program on the effects of ionizing radiations on the carcinogenic activity of various organic compounds, it has been found that deuteron bombardment of 20-methylcholanthrene produces a product which our preliminary data show is more active biologically than the original substance.

Solid 20-methylcholanthrene was bombarded with the Crocker Radiation Laboratory 20-Mev deuteron beam[1] for a total of 0.58 microampere hr. The melting point of the product was approximately 10° C below that of methylcholanthrene. No charring of the sample was observed. X-ray diffraction patterns indicate the presence of not more than 15% of unchanged methylcholanthrene in the irradiated sample. Chromatographic separations of the methylcholanthrene showed that some impurities were present in the sample. This impurity is being investigated for chemical and biological activity. From the irradiated sample three distinct fractions could be separated. The identifications of the fractions obtained are being carried out. As would be expected, the irradiated sample showed only short half-life radioactivity, which had completely decayed out prior to injection.

TABLE 1

		Dose (mg)	No. of mice used	No. of tumors developed	Avg. wt. of tumors (gm)
Irradiated material	Males	0.25	5	4	14.25
		0.125	5	5	7.1
		0.0625	5	2	2
	Females	0.25	5	3	14.6
		0.125	5	3	13.9
		0.0625	5	3	7.5
Unirradiated material Controls	Males	0.25	5	3	4.5
		0.0625	5	3	7.8
	Females	0.125	5	0	Died from toxic effect or other causes
Olive oil Controls	Males	0.00	5	0	Still living

Mice[2] of the C-57 strain were used in the experiment and injected subcutaneously with various amounts of methylcholanthrene or irradiated methylcholanthrene (unseparated), as indicated in Table 1.

The results in Table 1 indicate that there were significant increases in the size of the tumors with the irradiated material when compared with methylcholanthrene.

The malignant tumors produced by the irradiated sample and methylcholanthrene were of the same type—that is, fibrosarcoma. In two animals, in addition to the sarcoma, early epidermoid carcinoma was present. The systemic toxic effect of methylcholanthrene was reduced by irradiation when higher concentrations (0.125–0.25 mg) were used.

Detailed reports on the histopathology will be given elsewhere.

BENJAMIN F. BARNES, FRED C. FREYTAG, WARREN M. GARRISON, and IRENE ROSENFELD
Departments of Chemistry and Research Chemistry, University of Wyoming, Laramie

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Deformylation of 3-Formoxy Steroids on Activated Alumina

In discussing our experiments on the conversion of 3-formoxy steroids to 3-hydroxy steroids by chromatography over activated alumina (Fisher), W. Dasler (*Science*, April 9, p. 369) suggested that this deformylation is a special case of a more general hydrolytic splitting undergone by 3-hydroxy-steroid esters under these conditions. However, deformylation can be made to proceed quantitatively, whereas other ester groups are hydrolyzed only to a very minor extent. In fact, chromatography is a frequent means of purifying 3-acyl steroids. Therefore, aside from any theoretical implications, the deformylation reaction becomes of interest as a preparative tool in steroid chemistry.

There are a number of examples which indicate that the reaction is probably general. Cholesterol can be obtained quantitatively from cholesteryl formate (our unpublished observation). Ethyl-3(β)-formoxy-Δ^5-thiolcholenate gives ethyl-3(β)-hydroxy-Δ^5-thiolcholenate (Levin, *et al.* *J. Amer. chem. Soc.*, 1948, **70**, 511), and methyl-3(α)-hydroxy-12(α)-formoxy cholanate is obtained from methyl-3(α),12(α)-diformoxycholanate (Spero, McIntosh, and Levin. *J. Amer. chem. Soc.*, 1948, **70**, 1907). Additional studies are under way.

ROBERT H. LEVIN, A. VERN MCINTOSH, JR., and GEORGE B. SPERO
Research Division, The Upjohn Company, Kalamazoo, Michigan

On the Use of Roughage in Rat Diets

The following comments are added to those recently made by Davis and Briggs (*Science*, March 19, p. 292) regarding the note of F. Hoelzel and A. J. Carlson (*Science*, December 19, 1947, pp. 616–617) in their discussion of the "not uncommon type of error in the design of diets which makes the results of their use questionable." In this discussion Hoelzel and Carlson state: "A similar error, made by Guerrant and Dutcher (*J. Nutrition*, 1934, 8, 397), led to the erroneous conclusion