

related to it both in antigenic composition and biological characteristics.

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GONADECTOMY AND ADRENAL NEOPLASMS

CARCINOMA of the adrenal cortex is a relatively rare type of tumor in both man and in experimental animals. In man these neoplasms have been of unusual interest because of sexual disorders which have been associated with them. In experimental animals, carcinomas of the adrenal cortex have appeared too infrequently for critical study. Observations in this laboratory, however, indicate that primary carcinomas of the adrenal cortex can be produced in a high percentage of the individuals of at least one strain of mice by means of gonad removal.

It has been found that when mice of the extreme dilution strain (ce) were gonadectomized at two days of age, carcinoma of the adrenal cortex occurred in a high percentage of cases. Table 1 shows the frequency of these in various age groups up to one year. No such tumors have so far been observed in normal male and female mice of the ce strain. Adrenals of these mice are being studied in more detail, however.

Present knowledge indicates that sex hormones have an influence in the formation of certain types of neo-

plasms in mice. Increasing or decreasing these hormones is effective. It has been shown that injections of estrogenic hormones have been instrumental in

TABLE 1

Sex	Mice of ce strain Age at autopsy							
	4 months		6-7 months		8-10 months		11-12 months	
	No. of mice	Per cent with adrenal cancer	No. of mice	Per cent with adrenal cancer	No. of mice	Per cent with adrenal cancer	No. of mice	Per cent with adrenal cancer
Ovariectomized ♀♀ . . .	4	0	9	88.9	3	100	6	100
Castrated ♂♂ . . .	4	0	7	28.6	7	85.7	5	100

producing interstitial cell tumors of the testes,¹ carcinomas of the cervixes,² adenomas of the hypophyses³ and mammary gland carcinomas⁴ in mice. In the dba strain of mice gonad removal resulted in nodular hyperplasia of the adrenal cortex and carcinomatous changes of the mammary gland in both sexes.^{5, 6} It seems likely that all these results may be explained by the theory that hormonal imbalance is at least one of the factors leading to these forms of cancer. A more detailed study is to be reported elsewhere.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

IMPROVED APPARATUS FOR LIVER PERFUSION

LIVER perfusion studies in which the R.Q. of the liver was found from the arterio-venous blood gas differences have resulted in extremely low R.Q.'s which have been interpreted as support for the theory that oxygen is being utilized by the liver in the formation of carbohydrate intermediates from fatty acid or fatty acid intermediates. The methods used in former studies did not control or measure the escape of CO₂ from the surface of the liver. It is conceivable that the amount of CO₂ passing from the liver into the surrounding air is considerable and would be related to the tension of the CO₂ in the perfusate and the production of CO₂ by the liver. If this loss of CO₂ from the liver could be measured exactly in terms of volumes per cent. of CO₂, the A.V. R.Q. could be corrected for the amount lost.

The escape of appreciable amounts of CO₂ is demonstrable by perfusing the liver in an air-tight

tin box of known volume as shown in the accompanying diagram (Fig. 1). The box is washed out with warmed outside air at the start of the experiment. At the end of a given period of time the air in the box is sampled and analyzed for CO₂ and O₂. The CO₂ which enters the box from the surface of the liver is expressed in volumes per cent. from the total volume of perfusate passing through the liver during the period. The oxygen level in the box remains constant providing there are no leaks in the circulating system.

In Table 1 the average loss of CO₂ in volumes per

¹ C. W. Hooker, W. U. Gardner and C. A. Pfeiffer, *Jour. Am. Med. Assn.*, 115: 443-445, 1940.

² E. Allen and W. U. Gardner, *Cancer Research*, 1: 359-366, 1941.

³ W. Cramer and E. S. Horning, *Lancet*, 1: 247-249, 1936.

⁴ A. Lacassagne, *C. R. Acad. Sci.*, 195: 630, 1932.

⁵ Elizabeth Fekete, George Woolley and C. C. Little, *Jour. Exp. Med.*, 74: 1-8, 1941.

⁶ George Woolley, Elizabeth Fekete and C. C. Little, *Endocrinology*, 28: 341-343, 1941.