

Summary. Within the first 2 weeks following pituitarectomy in adult albino rats hemorrhagic changes are observed in the cortex of the suprarenal which precede the atrophy of the gland. The similarity to the changes observed soon after birth in humans is pointed out.

By inference this observation tends to strengthen the hypothesis that the severe hemorrhagic involucional changes noted in early extra-uterine life may be due to the withdrawal of the maternal adrenotropic hormone of the anterior lobe.

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Enzymatic Efficiency in Malignancy.*

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Recently we have begun a detailed investigation of enzymatic efficiency of avitaminosis.¹ Being at the same time engaged in a problem on the relationship of vitamin therapy to regression of tumors in the albino rat, we had access to considerable numbers of tumor-bearing animals and had available the necessary materials and equipment to study the enzymatic efficiency of malignancy.

We found our Wistar stock of animals rather resistant to the Flexner-Jobling carcinoma; consequently, the greater portion of our work was done on animals receiving another type of transplantable tumor, in which we had from 60 to 85% takes, provided the tumor used for implantation was not too necrotic. The tumor used was furnished by Dr. Francis Carter Wood of New York City, which was designated as Walker Carcino-Sarcoma No. 256.

The experiments were conducted in pairs, and for every animal with an implanted tumor, a litter-mate control of the same sex was used, which was restricted to the same plane of nutrition as the tumor-bearing animal. The tumors were measured with a caliper in length and width, and in some cases in depth. Forty-two groups were studied in the case of most enzymes. The blood serum phos-

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¹ Sure, B., Kik, M. C., and Buchanan, K. S., *J. Biol. Chem.*, 1935, **108**, 11.

phatase was included later in the investigation and was studied in 26 groups. The tumors ranged from 15 to 73 mm. in length and from 10 to 65 mm. in width. The age of the tumors of the implanted animals, the blood and tissue enzymes of which were studied, ranged from 3 to 5 weeks in most cases, but some individuals were allowed to proceed to the stage of pronounced ulceration and these tumors were about 7 weeks old at the time the animals were sacrificed. The tumors were embedded in formalin and examined microscopically by Drs. Thatcher and De Groat in Little Rock. The external observations showed cases varying from non-ulceration and slight ulceration to pronounced ulceration with pus oozing from the exterior. On microscopic examination there were present degeneration, necrosis and inflammation varying from one-fourth to three-fourths of the entire tumor. Ten different enzymes were investigated on the same animals, and Table I gives a general summary of these results, the details of which will appear elsewhere.

TABLE I.

% decrease in concentration of various blood and tissue enzymes of tumor-bearing albino rats compared with litter-mate controls of the same sex restricted to the same diet and same plane of nutrition.

Enzyme		Enzyme	
Blood Serum Amylase	48.5	Blood Serum Phosphatase	11.1
Blood Serum Esterase	47.0	Hepatic Lipase	8.7
Trypsin	39.0	Pancreatic Lipase	8.3
Hepatic Esterase	16.5	Pancreatic Esterase	7.3
Pancreatic Amylase	13.5	Erepsin	5.2

It is apparent that the most marked changes were found in the blood serum amylase, blood serum esterase and in trypsin. Small but definite changes were detected in hepatic esterase, pancreatic amylase, and blood serum phosphatase. The decrease in hepatic and pancreatic lipase, in pancreatic esterase and in erepsin are too small to be considered of any significance.

It is interesting to note that in 9 groups of animals implanted with the Flexner-Jobling Carcinoma practically the same effect of pronounced decreases in the blood serum amylase and esterase were found as in the 42 groups of animals implanted with the Walker Carcino-Sarcoma No. 256 furnished by Dr. Francis C. Wood.

We are continuing our investigations with other enzymes and other tumors.