

Nucleic acid patterns during growth and regression of the Murphy-Sturm lymphosarcoma in the rat*

It has been observed in this laboratory that the growth of tumors in mice and rats is accompanied by changes in the nucleic acid concentration of various tissues of the host¹⁻⁴. It has also been found⁵ that cortisone treatment of lymphosarcoma-bearing rats results in a retardation of the growth of the tumor. Concomitant with this effect, an increase in the lag period before the induction of the nucleic acid changes was observed. It was of interest to determine whether regression of a tumor would be accompanied by a complete reversal of the nucleic acid pattern to normal.

Murphy-Sturm lymphosarcoma** was implanted into Holtzman rats***. This tumor is apparently heterologous to these rats, and it often regresses after a period of rapid growth⁶. In our experiments, 60% of the tumors were found to regress. The desoxyribonucleic acid (DNA) was determined according to the method of STUMPF⁷ and the ribonucleic acid (RNA) by that of von EULER AND HAHN⁸.

In Table I are presented the nucleic acid data of the liver. Growth of the lymphosarcoma results in an increase in the desoxyribonucleic acid (DNA) content. Regression of the tumor is accompanied by a practically complete reversal of the increased DNA content to normal. On the other hand, the ribonucleic acid (RNA) concentration is not affected by either stimulus.

TABLE I

NUCLEIC ACID CONCENTRATION OF THE LIVER DURING GROWTH AND REGRESSION
OF THE LYMPHOSARCOMA

Condition of tumor	No. of rats	DNA mg/g dry weight	RNA
Controls	10	5.52 ± 0.1*	34.7 ± 1.0*
Maximal growth	17	10.3 ± 0.4	33.9 ± 0.9
Regressed	16	6.54 ± 0.3	34.5 ± 0.9

* Mean ± standard error.

Preliminary experiments have shown that progressive growth of the lymphosarcoma also causes an increase in the DNA concentration of the lungs. Here also, regression of the tumor has been found to result in a return of the lung DNA to normal values.

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⁵ Unpublished results.

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