TABLE V.
Summary of Amino Acids Which Occurred in Livers of Rats Fed Dye and in Tumors at Levels That Differed from Normal Liver by 15% or More.
(Expressed as % higher (+) or lower (—) in concentration than in normal liver).

Fraction	Livers from rats fed basal diet + dye		Rat liver tumors			
Whole homogenate			Methionine	—33		
			Cystine	+28		
			Glycine	+21		
			Phenylalanine	—25		
			Valine	—17		
Nuclei	Aspartic acid	—15				
			Methionine	—41	Histidine	—16
			Cystine	+30	Isoleucine	—15
			Glycine	+23	Lysine	—16
			Phenylalanine	—16	Leucine	—16
	Glutamic acid	+28	Glutamic acid	+22		
Large granules	Arginine	+20				
			Methionine	—28	Histidine	—18
			Cystine	+44	Isoleucine	—18
			Phenylalanine	—19	Threonine	—18
Small granules	Tryptophan	+16				
	Methionine	—17	Methionine	—24	Histidine	—19
			Cystine	+15		
			Phenylalanine	—18		
Supernatant fluid	Tryptophan	+33				
			Methionine	—25		
	Cystine	+20	Cystine	+25		
			Serine	+33		

fractions of normal liver. In addition, the concentrations of glutamic acid and glycine in the nuclear proteins and of serine in the supernatant fluid proteins were higher in the tumor tissue than in normal liver.

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Utilization of Guanine by the C57 Black Mouse Bearing Adenocarcinoma Eo771.* (17481)

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The effectiveness of the triazole analogue of guanine, azaguanine, in inhibiting the growth of subcutaneous transplants of mammary adenocarcinoma Eo771[1] in mice of the C57 black strain has been reported by Kidder, Dewey, Parks and Woodside[2] and confirmed for this tumor.[3] It was suggested by Kidder and co-workers[2] that their results indicated that the tumor tissue utilizes guanine for nucleic acid synthesis while normal tissue does not.

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1 Snell, G. D., Cloudman, A. M., and Woodworth, E., *Cancer Res.*, 1948, **8**, 429.

2 Kidder, G. W., Dewey, V. C., Parks, R. E., Jr., and Woodside, G. L., *Science*, 1949, **109**, 511.

We have investigated the incorporation of isotopically labeled guanine (containing N^{15} in the 1 and 3 nitrogens and in the 2-amino group[4]) into the nucleic acids of this strain of mouse bearing this tumor. The guanine was administered in five intraperitoneal injections, of 2.4 mg each, over a 6 day period, beginning on the 7th day after implantation of the tumor. Inasmuch as isotopic nitrogen, particularly from the 2-amino group, can be contributed to body pool ammonia[4] it is not unlikely that the isotope found in the protein residue, pyrimidines and even the adenine (Table I) arose from this source. There was, however, a small but definite incorporation into the guanine of the nucleic acids, but there is no evidence of a specific uptake by the tumor since the incorporation into the guanine of the tumor tissue and into that of the nontumorous viscera of the same mice was significant in each case.

When guanine was adminisered to an unspecified strain of the white rat[5] or to Sherman strain rats (Rockland Farms), either orally[4] or intraperitoneally,[6] there was no significant incorporation of the guanine into the tissue nucleic acids. The species difference in the purine metabolism of the Sherman rat and the C57 black mouse (bearing adenocarcinoma Eo771) makes it necessary to be conscious of other such possibilities in mammalian purine metabolism.

Incorporation of Guanine into Nucleic Acid of C57 Mice Implanted with Adenocarcinoma Eo771.

	Atom % excess N^{15}
Injected guanine	6.40
Viscera:	
Nucleic acids	.030
Total purines	.049
Guanine	.072
Pyrimidines	.024
Tissue residue (after extraction of nucleic acids)	.015
Tumor:	
DNA	
Total purines*	.046
Adenine†	.038
Guanine	.050
PNA	
Total purines*	.058
Adenine†	.037
Guanine	.105

* Isolated as the copper salts after separation of the pentose (PNA) and desoxypentose (DNA) nucleic acids by the Schmidt-Thannhauser procedure.

† Calculated from N^{15} values of adenine picrate.

[3] Sugiura, K., Hitchings, G. H., Cavalieri, L. F., and Stock, C. C., in press.

[4] Brown, G. B., Roll, P. M., Plentl, A. A., and Cavalieri, L. F., *J. Biol. Chem.*, 1948, **172**, 469.

[5] Plentl, A. A., and Schoenheimer, R., *J. Biol. Chem.*, 1944, **153**, 203.

[6] Brandt, A., Roll, P. M., and Brown, G. B., unpublished data.

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Behavior of Thyroid Toward Elements of the Seventh Periodic Group. II. Rhenium.*† (17482)

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On the basis of speculations made in a previous report[1] in which we suggested that not only iodine but all the elements of the seventh periodic group are selectively filtered by the thyroid, we have extended our work to include rhenium. As with Cl, Br, I, Mn and At, we find that Re also accumulates in the thyroid in greater concentration than

* A report of this work was made before the American Society of Biological Chemists at Detroit, May 1948. *Fed. Proc.*, 1949, **8**, 182.

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[1] Baumann, Emil J., and Metzger, N., PROC. SOC. EXP. BIOL. AND MED., 1949, **70**, 536.