that aliquot portions of each blood sample had to be used. The data from the remaining 4 experiments are closely similar to those shown in Fig. 2. Four of the 5 diabetic rabbits were sacrificed and submitted to necropsy. Necrosis and disappearance of pancreatic island tissues were evident. It thus becomes clear that our product, like the French, stimulates insulin secretion in rabbits with normal pancreas. The explanation for the occurrence of hyperglycemia in diabetic rabbits following the same compound requires further investigation.

Summary. 1. 2-Sulfanilamido-5-cyclopropyl-1,3,4-thiadiazole, like other sulfonamides, has a chemotherapeutic action against certain pathogenic bacteria. It has a low toxicity. There is no evidence of conjugation as judged by blood examination.

2. When given to normal rabbits, the substance uniformly causes hypoglycemia—with or without a slight initial rise of blood sugar. On the other hand, in diabetic rabbits induced by alloxan, it produces a definite rise of blood sugar.

The authors are indebted to Dr. Paul N. Harris for his post-mortem examination of our diabetic rabbits, and to Miss Marian H. Ellaby and Mr. Harold M. Worth for their assistance in making the charts.

15647 P

Glycolysis in *Trypanosoma equiperdum.*

GRAHAM CHEN AND E. M. K. GEILING

From the Department of Pharmacology, University of Chicago.

For some time there has been doubt as to whether a phosphorylative mechanism is involved in the breakdown of glucose in *Trypanosoma equiperdum.*[1-3] The purpose of this communication is to report experiments concerned with the metabolic pathway involved in the degradation of glucose by a blood-free preparation of lysed *Trypanosoma equiperdum.** Such a preparation was found to transform glucose into fructose 1, 6-diphosphate by phosphorylation, and to catalyze the splitting of fructose 1, 6-diphosphate and the coupled oxidation-reduction of 3-phosphoglyceraldehyde into phosphoglyceric

TABLE I.

The Transformation of Glucose into Fructose and Triose Phosphates by Lysed *T. equiperdum.*

The system contained 0.015 M $NaHCO_3$, 0.003 M $MgSO_4$, 0.015 M NaF, 0.015 M KCl, 0.012 M glucose, 0.003 M adenosine triphosphate (tipped in from side arm after equilibration), and 0.4 cc of a lysed preparation (equivalent to about 3×10^8 parasites) in a total volume of 2.0 cc in Warburg flasks; gas phase 5% CO_2-95% N_2; temperature 38°C; time of experiment, 1 hr; 0.2 cc of 100% trichloracetic acid solution added to terminate the reaction.

Glucose utilized,	CO_2 evolved,	Fructose formed,	ATP split (7 min. acid P.),	*20 min. alk. P. formed,	†Increase of 2 hour acid P.,
μg	μl	μg	μg	μg	μg
1176	15	779	107	21	50

* Triose phosphates.

† Glucose-6-phosphate and fructose 1-6-phosphate.

1 Reiner, L., Smythe, C. V., and Pedlow, J. T., *J. Biol. Chem.*, 1936, **113**, 75.

2 Barron, E. S. G., *Advances in Enzymology*, Vol. 3, 1943.

3 Dorfman, A., *Physiological Rev.*, 1943, **23**, 124.

* Fresh blood of an infected rat was made free of the blood elements by centrifugalization and washing twice with a 0.9% sodium chloride solution. A required amount of the parasites was then lysed with water.

TABLE II.

The Aldolase Activity of Lysed *T. equiperdum.*

The system contained 0.028 M $NaHCO_3$, 0.003 M Na_2CO_3, 0.015 M NaF, 0.015 M KCl, 0.008 M hexose-diphosphate (added from the side arm), 0.4 cc of a lysed preparation (about 3×10^8 parasites) in a total volume of 1.8 cc in Warburg flasks; gas phase 5% CO_2-95% N_2; temperature 38.5°C; reaction time 30 min.; 0.2 cc of 100% trichloracetic acid added to stop the reaction.

Fructose split,	20 min. alk. P. formed,
μg	μg
1140	201

acid.[2,4]

The transformation of glucose into triose phosphates was shown by the formation of acid, fructose and 20-minute alkaline hydrolyzable phosphates from glucose and adenosine triphosphate (Table I). The aldolase activity may also be shown by measuring the disappearance of fructose 1, 6-diphosphate and the quantity of triose phosphates formed (Table II). The activity of 3-phosphoglyceraldehyde dehydrogenase is indicated by the production of acid in a system containing fructose 1, 6-diphosphate, diphosphopyridine nucleotide and arsenate. The rate of this reaction is not influenced by the presence of pyruvate. Sodium iodoacetate inhibits the reaction (Table III).

TABLE III.

Effect of Pyruvate and Iodoacetic Acid on 3-Phosphoglyceraldehyde Dehydrogenase in Lysed *T. equiperdum.*

The samples contained 0.026 M $NaHCO_3$, 0.005 M Na_2HAsO_4, 0.03 M NaF, 0.00037 M DPN, 0.005 M fructose 1,6-diphosphate (tipped in from the side arm after equilibration), 0.5 cc of a lysed preparation (about 2×10^8 parasites) in a total volume of 2.5 cc. 0.01 M Na-pyruvate or 0.0012 M Na-iodoacetate was added as indicated. Warburg manometers; gas phase 5% CO_2-95% N_2; temperature 37.5°C. The values are the amounts of CO_2 evolved in microliters.

Sample	Time of reaction	15′	30′	45′	60′
Control system		10.1	15.7	20.6	23.9
Arsenate plus pyruvate		12.0	19.3	25.0	27.7
Arsenate plus iodoacetate		3.8	4.2	4.6	5.9

TABLE IV.

The Activity of Adenosine Triphosphatase in Lysed *T. equiperdum.*

The samples contained 0.4 cc veronal buffer of pH 7.4, 0.1 cc 0.154 M KCl, 0.1 cc 0.154 M $NaHCO_3$, 0.1 cc 0.0032 M ATP, 0.1 cc of a lysed preparation (about 2×10^7 parasites), and 0.1 cc of 0.003 M $MgCl_2$, 0.015 M $CaCl_2$, or 0.015 NaF; 0.1 cc of 100% trichloracetic acid was added to terminate the reaction. Temperature, 39°C; time, 1 hour.

Sample	% of ATP split
With Mg	39.1
With Ca	11.2
With F	0.0
Without Mg, Ca, or F	9.8

Adenosine-triphosphatase activity is high in the preparation (Table IV).

Conclusion. Our experiments indicate that glucose is degraded into pyruvic acid through phosphorylative processes in a blood-free preparation of lysed *Trypanosoma equiperdum.*

[4] Speck, J. F., and Evans, E. A., Jr., *J. Biol. Chem.*, 1945, **159**, 71.