

bated normal human erythrocytes and that this blocking action of ouabain was not modified by insulin.

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Riassunto

La conservazione al freddo degli eritrociti umani e di pollo per 6 giorni causa una fuoruscita di potassio dai globuli. Parte del potassio rientra nelle cellule durante incubazione a 37°C.

La uabaina blocca questo fenomeno. L'insulina non ha effetto significativo nè sull'assunzione di potassio da parte del globulo rosso, nè sull'azione bloccante della uabaina.

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Glucose and Potassium Transfer in the Isolated Heart of *Venus mercenaria*¹

The measurement of glucose uptake by the isolated rat diaphragm has been used for the determination of plasma insulin activity, but has several disadvantages. Among these are the difficult dissection, the variability of uptake from sample to sample, the relatively flat slope of the dose-response curve and the high cost. The heart of *Venus mercenaria*, the common sea clam, is a thin walled organ, of remarkably uniform size, cheap and easily obtained. It can be excised with little manipulation and without injury and continues to beat for 1 h or more when immersed in artificial sea water. Purpose of this work was to study the effect of insulin on the uptake of glucose and potassium by the clam heart *in vitro*.

Table I

Effect of insulin on glucose and potassium uptake by clam hearts incubated at 20°C in artificial sea water containing glucose

	No. of experiments	Glucose uptake (mg/g/h ± S.D.)	Potassium uptake (mEq/g/h/ ± S.D.)
Controls	10	2.08 ± 0.54	2.39 ± 0.40
Insulin	10	2.15 ± 0.73	2.80 ± 0.58

Clams were obtained from local commercial sources and kept in a wet burlap sack at about 4°C. Live animals, which would tighten their shell shut when gently tapped, were cracked with a hammer. The heart was excised by cutting the large blood vessels, the piece of intestine which passes through it was slipped out gently and the heart was allowed to contract in artificial sea water of VAN'T HOFF², prepared without KCl. After changing the liquid three times to allow complete rinsing of the heart cavities, 2 hearts were placed in a 20 ml beaker with 4 ml of sea water containing KCl (K = 5 mEq/l) and glucose (2 mg/

¹ Aided by a grant from the Chicago Heart Association.

² W. J. V. OSTEROUT, Bot. Gaz. 42, 127 (1906).

Table II

Effect of insulin on potassium loss in pre-digitalized clam hearts incubated in artificial sea water containing glucose

	No. of experiments	Potassium loss (mEq/g/h/ ± S.D.)
Controls	8	1.48 ± 0.60
Insulin	8	1.52 ± 0.79

ml). To some beakers glucagon-free insulin³ (0.5 u/ml) was added. In other experiments the hearts were immersed in sea water containing ouabain⁴ (12.5×10^{-4} mg/ml) for 1 h, before transfer to the incubation medium. Incubation was carried out in a Dubnoff shaker at 20°C in an atmosphere of 95% O₂-5% CO₂ and moving at the rate of 50 oscillations per min. After 60 min the hearts were removed, blotted on filter paper, and weighed on a torsion balance. Duplicate samples of the incubation medium were analyzed for glucose, according to NELSON⁵ and for potassium with a Coleman flame photometer.

Table I shows that the uptake of glucose and potassium by the heart of the sea clam is measurable and relatively uniform and that it is not modified by insulin added to *in vitro*. Table II shows that pre-digitalized hearts lose potassium into the incubation medium and that this loss is not influenced by insulin.

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Riassunto

Il cuore di *Venus mercenaria* consuma glucosio durante incubazione in acqua di mare artificiale. L'assunzione di glucosio è accompagnata da una penetrazione di potassio nell'organo. Cuori pretrattati con uabaina diffondono potassio nel medium di incubazione. L'insulina non modifica né l'assunzione di glucosio e potassio dei cuori normali né la diffusione di potassio dai cuori digitalizzati.

³ Gift of Eli Lilly & Co.

⁴ Gift of Sandoz Chemical Works, Inc.

⁵ H. NELSON, J. biol. Chem. 153, 375 (1944).

⁶ Trainee, Diabetes Teaching Grant No. 2A-5102, National Institute of Arthritis and Metabolic Diseases, Public Health Service.

An Anticonvulsant Effect of Monoamine Oxidase Inhibitors

CHEN *et al.*¹ observed that reserpine, though a sedative, lowers the threshold for electroshock and pentylenetetrazol (Metrazol) convulsions in mice. The time course of the effect coincides roughly with the lowering of brain serotonin (5-hydroxytryptamine) and norepinephrine². In contrast, phenothiazine tranquilizers do not lower the brain amines and have no clear-cut influence on electro-

¹ G. CHEN, C. R. ENSOR, and B. BOHNER, Proc. Soc. exp. Biol. Med. 86, 507 (1954).

² B. B. BRODIE, J. S. OLIN, R. G. KUNTZMAN, and P. A. SHORE, Science 125, 1293 (1957).