ties responsible for the characteristic tastes of substances. It is to be realized that the nature of the stimulus-receptor interaction is unknown and these exploratory-type experiments constitute an attempt to find a clue on a gross level.

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Energy Compensation in the Crabtree Effect with Ehrlich Ascites Carcinoma Cells

RECENTLY, Quastel and Bickis[1] published a very interesting and stimulating article concerning the energy relationships in several intact cell types, including the Ehrlich ascites carcinoma cell. They determined the ratio of lactate produced to the difference between oxygen consumed in the cell system with and without added glucose (average value 5·8). The assumption was made that the amount of adenosine triphosphate produced in the two systems was the same. They reasoned that if the total production of energy remained constant in the two cell systems, the ratio phosphorus/oxygen would be about 3.

Table 1. ENERGY RELATIONSHIP BETWEEN GLYCOLYSIS AND THE DEPRESSION OF RESPIRATION OF THE CRABTREE EFFECT

Compound (μM per ml. cells)	With glucose	Endogenous	$\frac{\text{Lactate}}{\Delta \text{ Oxygen}}$
Oxygen utilized	16·3	27·7	
Lactate accumulated	57·2	—	5·0
Adenosine triphosphate present	1·60	1·65	(P : O = 2·5)

Incubation system: 12·4 volume per cent of tumour cells in phosphate Locke's solution, *p*H 7·4; 30° C. for 15 min.; glucose 51·7 μM per ml. cells.

We recently published observations[2] on the Ehrlich ascites cells which show that the adenosine triphosphate content of the endogenous- and the glucose-containing cell is the same, except for an initial brief period of equilibration. This means that glycolysis does produce an amount of energy equivalent to the energy lost by the decreased oxygen consumption, provided the utilization of adenosine triphosphate remains constant. Furthermore, Table 1 shows that the accumulation of lactate could nearly account for the decrease in oxygen consumption in terms of production of adenosine triphosphate, assuming a phosphorus/oxygen ratio of approximately 3 (2·5) and glycolytic production of 2 molecules of adenosine triphosphate per glucose molecules. These results are in good agreement with Quastel and Bickis's hypothesis.

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PATHOLOGY

Homologous Species Neoplastic Antibodies

Prehn and Main[1], in a review of the subject, state that the demonstration of circulating cytotoxins is much simpler when heterologous tissue transplants are used as antigens than when homologous tissues are used. Schrek and Preston[2], using the Bagg rat lymphosarcoma in Sprague–Dawley rats, report the successful demonstration of serum cytotoxins in the rats (25 per cent of the total) in which the tumour had regressed.

The present communication deals with a limited investigation on the response of a human male to two cultures of human adenocarcinoma, arising in two different individuals.

Cultures of the neoplastic tissue were used instead of tissue homogenates in an effort to obtain as pure a cellular antigen as possible. Fresh cultures were used instead of known cultures of long standing because of the reported tendencies of long-term culture lines to become alike in antigenic characteristics[3].

(1) A healthy white male, blood type O,Rh-positive, was used as the antibody producer.

(2) Fragments of three adenocarcinomas were obtained from males at primary surgical removal and cultured by Puck's methods until pure cultures of the neoplastic cells were obtained. These separate cultures were labelled *C.P.*, *A.N.* and *C.G.*

(3) A portion of the living culture *C.P.*, estimated to be of the order of 10,000,000 cells, was suspended in salt solution and injected subcutaneously in the upper arm. The implant increased in size for ten days with marked local redness of the skin and moderate tenderness. By the fourteenth day the implant had decreased in size by 50 per cent. There was no systemic effect noted.

On the eighteenth day a similar amount of culture *C.P.* was introduced as before in a new location. The local reaction was immediate but decreased by half by the sixth day after implantation.

A third implantation of like amount was accompanied by local reaction more violent than the preceding two and by mild general systemic reaction lasting 24 hr. Disappearance of the local mass was almost complete at the end of the sixth day.

Seven days after the third implantation of *C.P.*-cultured cells, blood was withdrawn, the serum separated and an amount of this serum, equal to 1/400 of the total nutrient solution, was added to the nutrient solution consisting of 40 per cent adjunct nutrient solution. The nutrient solution, minus the immune serum addition, was the one used previously on all cell cultures and had proved adequate for growth.

A culture each of *C.P.*, *A.N.* and *C.G.* was drained of nutrient solution, washed and the nutrient solution containing the immune serum introduced.

The cultures were examined at 6, 12 and 24 hr. Culture *C.P.* at the end of 6 hr. showed nuclear degeneration, the nucleus in most cases forming an amorphous halo. There was marked rounding and shrinking of the cells. Subcultures taken at this time failed to grow, as did those made at 12 and 24 hr. Cultures *A.N.* and *C.G.* showed no effect of the immune serum, and both were successfully subcultured.

An identical series of implantations on the same individual were made except that in the second case cultures of *A.N.* were used as antigen. There were