Table 1. EFFECT OF GROWTH HORMONE ADDED *in vitro* ON THE UPTAKE OF GLUCOSE BY THE ISOLATED RAT DIAPHRAGM

Batch No. of growth hormone (G.H.)	Glucose uptake, mgm. glucose/gm. of wet diaphragm/hr. of incubation. Mean ± S.E. of mean. In the presence of G.H. at a concentration of: 0 μgm./ml.	10 μgm./ml.	25 μgm./ml.	50 μgm./ml.	100 μgm./ml.
(*A*) In Stadie-Zapp buffer (ref. 3)					
48 G.H.1	3·07 ± 0·19	3·45 ± 0·17	3·66 ± 0·17*	3·94 ± 0·19†	—
56 G.H.1	2·86 ± 0·19	—	3·72 ± 0·21*	3·71 ± 0·18†	3·35 ± 0·17
56 G.H.1	3·42 ± 0·09	—	4·06 ± 0·10‡	—	—
(*B*) In Gey and Gey buffer (ref. 7)					
48 G.H.1	4·14 ± 0·22	4·00 ± 0·20	4·39 ± 0·39	4·38 ± 0·26	—
56 G.H.1	3·22 ± 0·21	—	3·42 ± 0·35	3·51 ± 0·40	4·10 ± 0·51
56 G.H.1	2·58 ± 0·30	—	2·44 ± 0·18	—	—

* $P < 0·05 > 0·01$ compares G.H. group to control group.
† $P < 0·01 > 0·001$ compares G.H. group to control group.
‡ $P < 0·001$ compares G.H. group to control group.
Each figure is the mean of six observations.

(*A*) Stadie–Zapp (ref. 3) buffer-composition: sodium phosphate buffer *p*H 7·40, 0·04 *M*; $MgCl_2$, 0·005 *M*; NaCl, 0·08 *M*.
(*B*) Gey and Gey (ref. 7) buffer-composition: Na_2HPO_4, 0·0008 *M*; $MgCl_2$, 0·001 *M*; NaCl, 0·096 *M*; KCl, 0·005 *M*; $NaHCO_3$, 0·027 *M*; $CaCl_2$, 0·0013 *M*; KH_2PO_4, 0·0002 *M*; $MgSO_4$, 0·0003 *M*.

hormone to the Gey and Gey buffer produce a significant change in the glucose uptake of the isolated diaphragm.

It is apparent from these observations that at least a part of the difference between the reports indicating that growth hormone *in vitro* stimulates glucose uptake[1,2] and those showing that growth hormone is without effect *in vitro*[4,6] may be accounted for on the basis of the composition of the buffer media employed for the incubations. These investigations indicate that the composition of the buffer media may be of paramount importance in investigations of the *in vitro* effect of hormones on isolated tissues.

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Effect of the Growth Hormone of the Anterior Lobe of the Pituitary on the Reticulo-Endothelial System

MOON *et al.*[1–3] found that prolonged administration of growth hormone to rats results in more neoplasms arising in the pulmonary and lymphatic tissues, adrenal glands and reproductive organs than would be expected to occur spontaneously. They also showed that hypophysectomy prevents the development of spontaneous and growth hormone-induced tumours[4] and effectively inhibits the carcinogenic effect of methyl cholanthrene[5].

Further, it has been stated that the reticulo-endothelial system is an important defence against malignant growths, for if the system is blocked the incidence of new growths is increased, whereas if it is stimulated the incidence is diminished[6,7].

In view of the above reports the effect of growth hormone on the reticulo-endothelial system was investigated.

Nineteen male guinea pigs, aged about one year, were used in the investigation. The reticulo-endothelial macrophages were studied by giving all the animals one daily injection of trypan blue subcutaneously for the last six days prior to being killed by chloroform. The dosage of the dye was calculated on the basis of 0·8 ml. of a 1 per cent solution in distilled water per 100 gm. body-weight. Seven of the animals were given dye only and were used as controls. The remaining animals were divided into two groups of six and given growth-hormone (Organon) in addition to the dye. The growth hormone was dissolved in olive oil and given once daily by intramuscular injection. Six animals received 100 μgm. of growth hormone once daily for one week and the remaining six were given 100 μgm. daily for three weeks. Specimens were taken from the spleen, liver and lymph nodes and fixed in Heidenhain's 'Susa' fluid. Sections were cut at 10μ thick and stained with weak eosin, dilute carbol fuchsin or alum carmine. The activity of the reticulo-endothelial system in the organs studied was assessed by the number of dye-bearing cells and the intensity of the vital staining.

The results were as follows: Three of the six animals which received 100 μgm. of growth hormone for one week showed a reduction in the intensity of vital staining in the macrophages of the spleen but the vital staining appearances in the liver and lymph nodes remained similar to the controls. The three remaining animals of this group showed vital staining appearances similar to those of the controls. In the group of six animals which received 100 μgm. of growth hormone for three weeks the number of dye-bearing cells and the intensity of the vital staining were practically identical to those seen in the control animals.

The above results indicate that growth hormone has little or no effect on the phagocytic activity of the reticulo-endothelial system.

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