

to fade by 12 h and has completely disappeared before 18 h. The inner band has started to fade by 48 h and has completely disappeared before 56 h. It therefore seems that the rate of digestion of serum protein is not uniform. To identify the fraction which persists for a longer period, immunoelectrophoresis was done, using normal human serum on one side and the mosquito antigen obtained after 48 h of digestion on the other (Figure 2). The Antihuman serum in the central trough was the same as used for gel-diffusion. A clear arc of precipitin was obtained with the mosquito antigen whose mobility

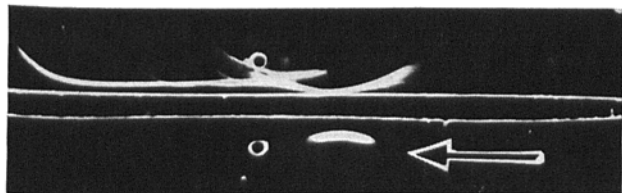


Fig. 2. Normal human serum on the upper side and antigen obtained 48 h after intake of blood meal on the lower side. Arrow marks the precipitin arc produced by the antigen.

corresponded to the Albumin fraction of the human serum. These findings confirm the observations made by WILLIAMS² that the Albumin fraction of the serum persists for a much longer period than the Globulins. In view of these findings, it is felt that antisera produced against the Albumin fraction of the serum could be used with a greater advantage for identification of blood meals in the field.

Zusammenfassung. Die Verdauungsgeschwindigkeit von Serumproteinen im Darm von Mücken (*Armigeres subalbatus*) wurde mit Gel-Diffusion und Immunelektrophorese bestimmt. Es konnten wenigstens 2 Bänder mit Gel-Diffusion in einer Mücke nachgewiesen werden, die menschliches Blut gesaugt hatte. Während das äussere Band nach 12–18 h verschwindet, konnte das innere noch nach 48–56 h als Albuminfraktion des menschlichen Serums bestimmt werden.

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The Effect of D-Mannoheptulose on Islets of Langerhans Cultured in vitro

D-mannoheptulose blocks the release of insulin from the pancreas¹⁻³. It was found⁴ that the β -cells of the islets of Langerhans isolated from the guinea-pig pancreas and cultured in vitro up to 14 days underwent more or less intensive degranulation. Since the number of granules in β -cells is proportional to the amount of extractable insulin in the pancreas⁵, it was supposed that the degranulation of β -cells occurring in vitro could be prevented by mannoheptulose.

Methods. The islets of Langerhans of guinea-pigs were isolated and cultured as before⁴. The tissue culture medium consisted of equal parts of human plasma, human serum, chick embryo extract, Hanks solution and glucosol. Groups of islets were cultured for 7 days at low (about 100 mg%) and at high (about 400 mg%) glucose concentration, without mannoheptulose or in presence of mannoheptulose at 300 mg% concentration. In other experiments, islets were cultured for 1 week at low glucose concentration and during the second week in the 4 media mentioned above. Over 20 islets were cultured in each medium. Mannoheptulose dissolved in glucosol was sterilized by autoclaving. Isotonicity of the medium was secured by proper adjustment of the NaCl concentration. The cultured islets were embedded, sectioned and stained as before⁴.

Results. The morphological appearance of the islets cultured in the absence of mannoheptulose was similar to that described before⁴. β -cells in culture as compared to normal uncultured β -cells were partially degranulated, particularly at high glucose concentration. The islets cultured in the presence of mannoheptulose were well preserved morphologically but the β -cells both at low and high glucose concentration, contrary to expectation, were completely degranulated. This effect of mannoheptulose was observed in one- as well as in two-week cultures.

The blocking action of mannoheptulose on insulin release is firmly established¹⁻³. To explain the complete degranulation of the β -cells cultured in the presence of mannoheptulose, it is necessary to assume that this sugar also interferes with insulin synthesis. Small output of insulin at low glucose concentration is not affected by mannoheptulose³. If mannoheptulose interferes with insulin synthesis, which is compatible with its inhibitory action on glucose phosphorylation⁶, the insulin present in the granules of β -cells at the beginning of culture could be slowly released and the formation of new insulin containing granules would be prevented. It remains to be seen whether prolonged administration of mannoheptulose evokes also degranulation of β -cells in vivo⁷.

Zusammenfassung. β -Zellen der Langerhansschen Inseln vom Meerschweinchen in vitro gezüchtet, unterliegen bei Anwesenheit von Mannoheptulose einer vollkommenen Degranulierung. Es wird die Möglichkeit diskutiert, ob Mannoheptulose nicht nur die Auslösung des Insulins blockiert, sondern auch seine Bildung beeinflusst.

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⁷ The author is indebted to Prof. E. SIMON, Rehovoth (Israel) for his generous gift of mannoheptulose required for this study.