OBSERVATIONS OF AGE AND ENVIRONMENTAL INFLUENCES ON THE THYMUS KEPT IN TISSUE CULTURE

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In our earlier examinations we have demonstrated the presence of Gomori-positive cells in the tissue cultures of thymus of Wistar CB rats of various ages. Besides Gomori-positivity, these cells gave positive PAS-reaction, too, and exhibited histamine and serotonin fluorescence. Tissue cultures of the thymi of older rats contained these cells in greater number. The influence of TSH increased the number of these cells (4).

On the basis of our earlier studies (1) we have supposed that for the iodine uptake of the thymus these cells alone could be responsible. For that very reason, we examined, in the present experiments, whether the Gomori-positive cells in the thymus cultures of Wistar CB rats of various ages are capable of iodine uptake either spontaneously, or after TSH stimulation.

MATERIALS AND METHODS

Pieces of thymi of newborn, 15 day old and 100 g rats were explanted to cover glass stripes coated with coagulated hen plasma containing chicken embryo extract. The stripes with the explants were then placed into H-tubes. As cultivating medium the following mixture was used: synthetic medium of No. 199 (Parker), calf serum, lactalbuminhydrolysat (0.5% in Hanks) and chicken embryo extract in the ratio of 75% + 10% + 10% + 5%. This medium contained also penicillin (100 IU/ml). After a week of cultivation the cultures were incubated for 10 min in the above medium containing 125I (potassium iodide) 2 μCi/ml of TSH (Ambinon, Organon) 1 IU/ml in the following experimental arrangements:

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1. cultures incubated with $^{125}$I for 10 min,
2. cultures incubated with TSH for 10 min and then with $^{125}$I for 10 min,
3. cultures incubated with $^{125}$I for 10 min and then with TSH for 10 min.

After incubation, the cultures were fixed in Carnoy's fixative. Thereafter, the glass stripes carrying the cultures were stuck to slides with Canada balsam and coated with Ilford G 5 emulsion. The emulsion was diluted with double-distilled water (1:1) and then kept in a water bath regulated to 42°C for 30 min. The slides coated with the emulsion were dried at angles of 45°C and then exposed for one week and two in the dark, at 4°C. After exposure the preparations were developed in ORWO A 49 developer for 5 min and then fixed in acidic fixative. After this, PAS-reaction and hematoxylin staining were performed on the preparations.

RESULTS

Above the region of the explanted pieces a large number of grains was observable. In the migration zone only the PAS-positive cells accumulated the iodine (Figs. 1 and 2). The number of the grains was greater above the rounded PAS-positive cells than above the flattened and processed ones. At the same time the other cells remained unmarked. The number of the labelled PAS-positive cells was greater in the cultures prepared from the thymus of newborn rats in comparison with the cultures made from 15 day old animals.

Fig. 1. Tissue culture of the thymus of the adult rat. PAS-positive cell filled with secretion. Grains are above the cytoplasm. PAS - H, X 320.