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Effect of Cell Growth Activating Tissue Extracts, Parenterally Applied, on Experimental Skin Wounds.*

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In the preceding paper^{1,2} we showed that the local application to experimental skin wounds of cell growth promoting preparations, obtained from adult as well as embryonic tissues, does not result in an acceleration of the healing process in the treated wounds, as compared with control wounds in the same animal. It is necessary to stress, however, that on closed examination of the data presented² it becomes evident that both the treated and control wounds in the same experimental animal, compared with wounds of the same size and location in untreated animals close more rapidly. This suggests that the results of our experiments employing local treatment of experimental skin wounds in rats were only apparently negative. It seems likely that the locally applied cell growth promoting extracts do exert an accelerating action on the rate at which the wounds heal. This acceleration, however, could not be perceived from a comparison with control wounds in the same animal, since the healing process in the latter, too, was hastened. Thus, the possibility must be envisaged that the effect of cell growth-promoting tissue extracts on wound healing is not local, but of a general nature.

As an approach to this question experiments were undertaken to determine the effect on wound healing of cell growth-promoting adult tissue extracts administered parenterally. The wound-healing process in animals treated in this way was compared with that in untreated control animals.

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¹ Doljanski, L., and Auerbach, E., *PROC. SOC. EXP. BIOL. AND MED.*, 1944, **55**, 112.

² Auerbach, E., and Doljanski, L., *Brit. J. Exp. Path.*, 1944, **25**, 38.

TABLE I.
Results of Wound Healing Experiments.*

Exp. No.	Closure time in days in rats	
	Treated	Untreated
96	16	23
129	15	22
130	17	16
131	16	22
132	17	20
133	17	19
134	13	20
135	16	23
193	18	21
197	18	24
199	16	20
201	18	21
203	17	18
247	17	22
249	16	19
251	16	28
252	16	24
253	18	27
275	17	22
276	18	20
277	19	22
278	20	21
279	19	21
280	17	21
281	16	21
282	17	21
283	17	21
284	15	21
285	19	25
286	16	22

I. Mean period required for healing in rats

(a) treated 16.9 days
(b) untreated 21.6 days

S.E. of mean in rats

(a) treated ± 0.26
(b) untreated ± 0.44

II. Difference between controls and treated 4.7 days

S.E. of difference ± 0.51

III. Percentage difference of mean periods, 21.8%

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The experiments were performed on white rats, averaging 180 g in weight. In each experiment two animals of equal size and of

the same sex (in most cases littermates) were chosen. One circular wound of 20 mm diameter was produced on the back, the skin being excised down to the superficial fascia.

The technic of producing wounds was that described in the previous paper. The method of treatment consisted in intraperitoneal injections of 1 cc sterile 33% saline extract of adult chicken heart, on every second day. The control animal remained untreated. The wounds of both animals, treated and untreated, were covered with lanolin and sterile gauze, the dressing being changed daily. The experimental and control wounds were measured at intervals of 48 hours. The injections were begun on the day of operation and continued until the wounds were completely healed. The criterion of healing was based on the complete closure of the wounded area.

The results of the present investigations are given in Table I.

These data indicate that in rats treated with intraperitoneal injections of saline extract of adult chicken heart the closure time of the wounds is on the average 21.8% shorter than

in the untreated controls. These results are in agreement with earlier experiments of Roulet,³ Lorin-Epstein,⁴ Amorosi,⁵ and Sandelin and Björkstén,⁶ who observed stimulation of wound healing following injections of extracts of embryonic tissues.

Summary. Rats with experimental skin wounds received intraperitoneal injections of saline extract of adult chicken heart. The course of wound healing in animals treated in this way was compared with the healing process in wounds of equal size in untreated rats. The experiments showed that treatment with cell growth-promoting extracts of adult hearts caused a significant reduction (21.8%) in the mean time required for healing, as compared with the controls.

³ Roulet, F., *C. R. Soc. de biol.*, 1926, **95**, 390; *Ann. d'anat. path.*, 1927, **4**, 337.

⁴ Lorin-Epstein, M. J., *Arch. f. klin. Chir.*, 1927, **144**, 632.

⁵ Amorosi, O., *Riv. di pat. sper.*, 1931, **6**, 33.

⁶ Sandelin, M., and Björkstén af G., *Finska läk.-sällsk. handl.*, 1932, **74**, 826.

14862 P

Liver Changes Associated with a Transplantable Granulosa Cell Carcinoma in Mice.*

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Earlier experiments^{1,2} have indicated that irradiation of the entire body of mice results in the development of granulosa cell tumors of the ovary in many of the X-rayed animals. Although many tumors attained a large size,

none of the induced ovarian growths of our first series³ has metastasized to distant organs, and for this reason the neoplastic character of these tumors was questioned.

In the present series, granulosa cell tumors were induced by a single dose of 175 or 350 r. Many of these animals are still alive, and a final analysis of the incidence of ovarian tumors cannot be presented. In one com-

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¹ Furth, J., and Furth, O. B., *Am. J. Cancer*, 1936, **28**, 54.

² Geist, S. H., Gaines, J. H., and Pollack, A. D., *Am. J. Obs. and Gyn.*, 1939, **38**, 786.

³ Furth, J., and Butterworth, J. S., *Am. J. Cancer*, 1936, **28**, 66.

⁴ Traut, H. F., and Butterworth, J. S., *Am. J. Obs. and Gyn.*, 1937, **34**, 987.

⁵ Butterworth, J. S., *Am. J. Cancer*, 1937, **31**, 85.