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GROWTH OF SYNGENEIC TRANSPLANTABLE TUMORS IN SYRIAN HAMSTERS IMMUNIZED WITH EMBRYONIC HAMSTER TISSUE

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The effect of immunization with embryonic tissue on growth of two syngeneic transplantable tumors was investigated in Syrian hamsters. Immunization of inbred hamsters with embryonic hamster tissue followed by transplantation of continuous lines of syngeneic tumors was shown neither to inhibit nor to stimulate growth of the tumors. It is suggested that embryonic antigens do not participate in the mechanism of transplantation antitumor immunity.

KEY WORDS: embryonic antigens; immunization.

The possibility of using embryonic antigens for immunization against tumors is a topic for discussion. Evidence that immunization with embryonic antigens can prevent both the formation of primary induced tumors and growth of transplanted tumors has been obtained [1, 2]. Other workers have described the unsuccessful results of such immunization [4, 5]. Some workers who obtained positive results by immunization with embryonic cells against tumors induced in Syrian hamsters with SV_{40} virus state in their later communications that several conditions must be closely observed if immunization with embryonic tissue is to be successful [3]. These conditions are as follows: 1) the embryos must be of a certain age (in particular, 9-10 days for Syrian hamster embryos); the suspension of embryonic cells must be prepared by mechanical dispersion without the use of trypsin or versene; 3) the embryos must be from females pregnant for the first time; 4) triple immunization of the animals with embryonic tissue is essential; 5) the embryonic tissue must be irradiated to prevent its differentiation in vivo and the formation of embryos; 6) the most sensitive modification of the transplantation test must be used.

The effect of the first and subsequent gestations on the frequency of origin of primary tumors induced by virus SV_{40} in Syrian hamsters was investigated previously. The results showed that the significant decrease in the frequency of tumor formation in multiparous females is not an immunologic phenomenon.

The object of the present investigation was to study the effect of immunization with embryonic hamster tissue on growth of two transplantable tumors in inbred hamsters.

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TABLE 1. Growth of Two Transplantable Tumors in Animals Immunized and Not Immunized with Embryonic Tissue

Animals	Results of transplantation test with E-1 cells		Results of transplantation test with GT11B cells	
	log TD_{50}	log IR	log TD_{50}	log IR
Normal hamsters (control)	1,85	—	2,54	—
Hamsters immunized with cells from 9-10-day embryos	1,92	0,07	2,41	0,13
Hamsters immunized with cells from 15-16-day embryos	1,71	—0 14	2,54	0,00

Legend. Log TD_{50}) dose of tumor cells giving tumor growth in 50% of inoculated animals; log IR) index of resistance, determined as difference between log TD_{50} in control and experimental animals.

EXPERIMENTAL METHOD

The recommendations of Coggin and Anderson [3] for obtaining the immunizing material were followed completely. Embryonic tissues from 9-10-day (potentially immunogenic material) and 15-16-day embryos (nonimmunogenic material) from primiparous Syrian hamsters were used. The suspension of embryonic cells was obtained by mechanical dispersion of the tissue without the use of trypsin or versene. Before injection into the animals the material was irradiated on the Stebel apparatus (5000 R). Syrian hamsters of the ICV strain were immunized by three injections at weekly intervals. Each hamster received an intraperitoneal injection of 5×10^6 cells in 1 ml. The level of resistance of the immunized and control animals was determined 2 weeks after the last immunization by inoculating them with five different doses of syngeneic tumor cells, each dose differing by a factor of 10 from the previous dose. The test tumors used were two transplantable strains of tumors obtained initially in ICV hamsters: a sarcoma induced by virus SV_{40} (strain E-1) and a spontaneous hepatoma (strain GT11B).

EXPERIMENTAL RESULTS

The results of inoculation of the five different doses of test tumor cells, differing by a factor of 10, into control ICV hamsters and into hamsters immunized with cells of 9-10-day or 15-16-day embryos are given in Table 1. The results show that immunization with embryonic hamster cells did not affect growth of the transplantable tumors of different origin. The results of the transplantation test were identical in all three groups of experiments: 1) during growth of E-1 and GT11B tumors in animals immunized with 9-10-day embryos; 2) the same, in animals immunized with 15-16-day embryos; 3) during growth in unimmunized animals. The results thus contradict the findings of Coggin et al. [1, 2] and confirm those obtained by Ting et al. [4, 5]. The writers showed previously that immunization with embryonic antigens during pregnancy neither inhibits nor stimulates the growth of tumors induced by virus SV_{40}, if the frequency of onset of tumors in a group of parous females is compared with the corresponding frequency in a control group of males.

The present investigation showed that triple immunization of inbred hamsters with embryonic hamster tissue, followed by transplantation of continuous lines of syngeneic tumors into the animals leads neither to inhibition nor to stimulation of tumor growth. It can tentatively be suggested that embryonic antigens do not participate in the formation of transplantation antitumor immunity.

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