EFFECT OF IMMUNIZATION WITH ANTIGENS FROM HETEROLOGOUS AND AUTOLOGOUS LIVER ON METASTASIZATION OF WALKER'S CARCINOSARCOMA IN PARABIONT RATS

I. N. Maiskii and L. L. Khundanov

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Malignant tumors are known to metastasize at places in the body which are injured by biological, physico-chemical, and mechanical agents [1, 2, 6].

The authors' earlier experiments showed that during immunization of rats with antigens from autologous and heterologous liver tissue mixed with Freund's complete adjuvant, antibodies reacting in the complement fixation reaction, the gel-diffusion reaction, and the reaction of immunoelectrophoresis with antigens from the animal's own liver, appear in the blood of these animals. In the liver of immunized animals, destructive changes are found in the shape of foci of necrosis.

In the present investigation the effect of immunization of animals with homogenates of autologous and heterologous liver mixed with Freund's complete adjuvant was studied on the metastasization of Walker's carcinosarcoma in parabiont rats.

Investigations by E. and B. Fisher [5], together with the authors' earlier investigations [4], the use of the method of parabiosis between animals, provides a convenient model for studying the principles governing metastasization of malignant tumors.

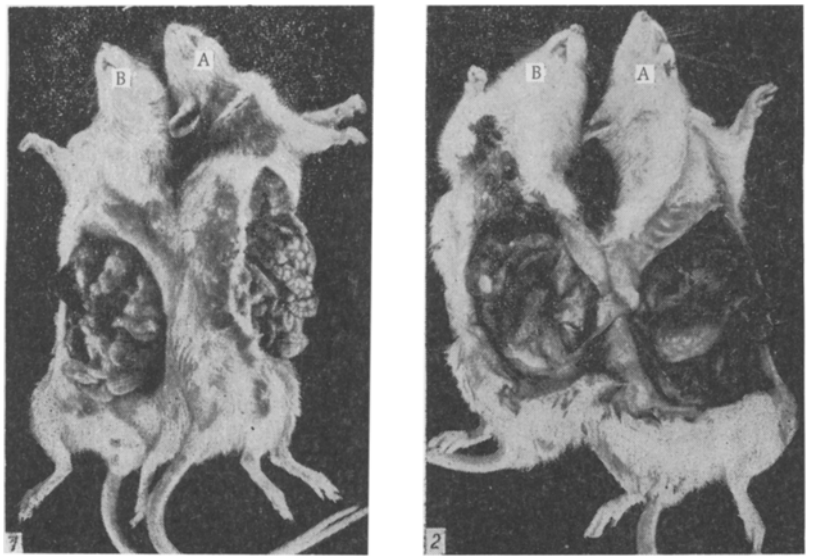

Fig. 1. Metastases in the liver of parabiont A and B partners after immunization with antigens from heterologous (1) and autologous (2) liver mixed with Freund's complete adjuvant.

Fig. 2. Presence of metastases in the liver of the parabiont A partner and their absence in the liver of the parabiont B partner in the control group.

Laboratory of Growth and Development of Tissues, Institute of Experimental Biology, Academy of Medical Sciences of the USSR, Moscow (Presented by Active Member of the Academy of Medical Sciences of the USSR A. D. Ado). Translated from Byulleten' Éksperimental'noi Biologii i Meditsiny, Vol. 63, No. 6, pp. 94-96, June, 1967. Original article submitted July 2, 1966.

Distribution of Metastases in the Organs of Parabiont Rats Immunized with Antigens from Heterologous and Autologous Liver with Freund's Adjuvant

Material for immunization	No. of parabionts used in expt.	Metastases in liver		Metastases in lungs	
		partner A	partner B	partner A	partner B
Heterologous (rabbit's) liver	28	25	7	10	6
Autologous liver	32	28	6	8	5
Isologous muscle (control I)	24	20	0	7	4
Parabionts without treatment (control II)	21	16	0	5	4

EXPERIMENTAL

The experiments were carried out on 210 female August rats weighing 100-120 g, divided into four groups.

The rats of group 1 (28 animals) were immunized with five injections of homogenates of heterologous (rabbit's) liver. The animals of groups 2 and 3 underwent removal of 70% of their liver. The rats of group 2 (32 animals) were immunized 14 days after the operation with five injections of antigens from autologous liver, and the rats of group 3 (24 animals) with antigens from isologous muscle tissue.

Ten days after the last immunization these rats were joined in paraboisis with normal August rats by the method of celiostomy as modified by the authors [3]. Fourteen days after the anastomosis the unimmunized parabiont partner received an injection of 250,000 cells of the ascites form of Walker's carcinosarcoma into the portal vein. The animals were sacrificed three weeks after injection of the tumor cells. To determine the development and localization of the metastases the surface of the organ was inspected and serial sections, cut to a thickness of 4 mm, were examined.

The parabiont rats receiving the injections of tumor cells were conventionally called the A partners and the immunized rats the B partners.

EXPERIMENTAL RESULTS

The results obtained are given in the table.

It is clear from the table that of the 28 pairs of parabionts in group 1, in which the B partner was immunized with antigens from heterologous liver, in 25 cases the A partners developed tumors. Metastases in the liver of the parabiont B partners of this group were found in 7 cases (Fig. 1,1). After immunization of the B partner with antigens from autologous liver, tumors developed in 28 parabiont A partners of the 32 pairs of rats. Metastases developed in the liver of the B partners in 6 cases of this group (Fig. 1, 2).

In the control groups (immunization with muscle tissue or no immunization) in no case did developing tumors in the parabiont A partners produce metastases in the liver of the B partner (Fig. 2).

In some cases the developing tumors also metastasized in the lungs of both the A and the B partners. However, no regular pattern could be observed regarding the development of metastases of the lungs of these parabiont rats.

As the results described above show, metastases were found in the liver of the parabiont B partners, only if they had been immunized with antigens of autologous and heterologous liver mixed with Freund's complete adjuvant.

The results show that pathological immune processes in the organs contribute to the localization and development of metastases in a particular organ.

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