ANTIBODIES AGAINST DNA IN THE SERUM OF PATIENTS AND ANIMALS WITH TUMORS

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The serum of patients with systemic lupus erythematodes contains antibodies against DNA. It has been found [3] that many sera of healthy persons and normal animals contain antibodies to denatured DNA, whereas antibodies against both denatured and native DNA have been found in the serum of patients with severe systemic lupus erythematodes.

In the present investigation the titer of antibodies against DNA was studied in the serum of patients with various forms of cancer and also in the serum of albino rats with transplanted tumors.

EXPERIMENTAL METHOD

The antibodies were determined by the passive hemagglutination reaction (PHR) [4]. The method of obtaining formalinized erythrocytes was described previously [1, 2]. Only batches of sensitized erythrocytes possessing high activity and capable of detecting antibodies against DNA in healthy humans were chosen.

The human and animal sera were absorbed by formalinized sheep erythrocytes, heated for 30 min at 56°, and then investigated in the PHR with DNA-sensitized and control erythrocytes. The antibody neutralization reaction (ANR) was carried out with sera agglutinating the sensitized erythrocytes to determine the qualitative nature of the antibodies. The ANR was carried out with both native and denatured DNA as described previously [4].

The experiments of series I were carried out on 16 albino rats weighing 100 g. A suspension (10%) of tumor cells of a sarcoma 45 was injected subcutaneously in the dorsal region, and tumors developed in all the animals. Blood was taken from the rats before and at various times after transplantation of the tumor.

In the experiments of series II, performed on 16 albino rats weighing 150-170 g, the serum was investigated 12 days after transplantation of a hepatoma RS-1. Intact animals of the same weight were used as controls.

Serum from healthy persons was taken for investigation at the Blood Transfusion Station. The patients from whom the sera were obtained were undergoing treatment in the clinic of the Rostov Oncologic Institute for carcinoma of the uterus (11), urinary bladder (9), lung (7), and larynx (2) and for reticulosarcoma of the tonsil (4).

EXPERIMENTAL RESULTS

In the experiments with albino rats with a transplanted sarcoma 45, antibodies against DNA were found in titers of between 1:10 and 1:20 2 weeks after inoculation, but one month after inoculation (some of the animals had died by this time) antibodies were found in only one animal.

A higher titer of antibodies against DNA was discovered in the animals used in the experiments of series II: in 5 cases it was 1:2560, in 3 cases 1:1280, and in 10 intact animals it did not exceed 1:10.

It was previously observed that the frequency with which antibodies against DNA are found, and also their titer, increased with age [3]. For this reason patients and healthy persons of about the same age were investigated. Investigation of the serum of the patients and healthy persons showed that antibodies are found more frequently, and in higher titer in the former (see table).

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Frequency of Detection of Antibodies Against DNA in Healthy Persons and Cancer Patients in the PHR

Subjects	Total	Titer of antibodies					Mean titer
		0	1:10	1:20	1:40	1:80	
Healthy	25	16	4	5	—	—	1:5,6
Patients	43	14	12	6	6	5	1:20,5

The ANR was carried out with the human and animal sera giving a positive result in the PHR, and in all cases the antibodies found were against denatured DNA. The results obtained thus demonstrate a link between tumor development and production of antibodies against DNA.

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