The antigens discovered are interesting because they may be antigenic markers for malignant transformation of certain types of cells: Their absence or presence in human malignant tumors must evidently correlate with whether the tumor arises from the cell producing them or from a cell not producing them.

The discovery of these antigens in stable human cell lines deserves attention: All HCL synthesizing them have for a long time been maintained as an infinitely transplantable line, and as a result of prolonged culture they must have lost their differentiated cells. Since the stomach is a derivative of the entoderm, and the breast and larynx (HeP-2) are derivatives of the ectoderm, it is difficult to postulate the participation of a common stem cell in the synthesis of the common antigens.

LITERATURE CITED


ANTIBODY FORMATION AGAINST ANTIGEN-RECOGNIZING RECEPTORS OF T LYMPHOCYTES IN A SYNGENEIC SYSTEM

V. G. Nesterenko and I. Yu. Chernyakhovskaya

Antibody formation against antigen-recognizing receptors of T lymphocytes were shown to be capable of being formed in a syngeneic system. Antiserum of CBA mice receiving intravenous injections of CBA lymphocytes immune against C57BL cells specifically inhibited blast transformation of CBA T lymphocytes against C57BL cells only in a mixed culture. The same antiserum had no effect on proliferative activity of CBA T lymphocytes reacting to "foreign antigen" – i.e., DBA/2 cells. No antibodies against C57BL cells likewise were found in the antireceptor antiserum. A regulatory influence of autoantireceptor antibodies on the immune response is postulated.

KEY WORDS: antigen-recognizing receptor; antireceptor serum; blast transformation

In recent investigations [2, 3, 7, 8, 13, 14, 16] so-called antireceptor sera, which specifically inhibit the response of lymphocytes to one antigen only without affecting immunoreactivity to other antigens, have been obtained in a xenogeneic or semiallogeneic system. It has been suggested [9, 12, 15, 17, 18] that the production of autoantireceptor antibodies, which may play an essential role in the regulation of the immune response, can take place in the body in situ.

The object of the present investigation was to study the possibility of formation of antireceptor antibodies in a syngeneic system and to examine their effect on T-lymphocyte function. The aim was to obtain antibodies specifically inhibiting proliferation of T lymphocytes of mice of one strain only against cells of mice of another strain in a syngeneic system in a unidirectional mixed lymphocyte culture.

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TABLE 1. Effect of Antireceptor Serum on Antigen-Recognizing Cells

<table>
<thead>
<tr>
<th>Group</th>
<th>Responding cells</th>
<th>Stimulating cells</th>
<th>Number of counts/min</th>
<th>Coefficient of stimulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CBA+ ARS</td>
<td>C57BL</td>
<td>2425±495</td>
<td>0.8</td>
</tr>
<tr>
<td>2</td>
<td>CBA+ ARS</td>
<td>DBA/2</td>
<td>34 680±11 989</td>
<td>11.2</td>
</tr>
<tr>
<td>3</td>
<td>C57BL+ ARS</td>
<td>CBA</td>
<td>21 643±7035</td>
<td>7.4</td>
</tr>
<tr>
<td>4</td>
<td>CBA+ normal serum</td>
<td>C57BL</td>
<td>32 820±12 164</td>
<td>10.6</td>
</tr>
<tr>
<td>5</td>
<td>CBA+</td>
<td>DBA/2</td>
<td>26 502±8733</td>
<td>8.5</td>
</tr>
<tr>
<td>6</td>
<td>C57BL+</td>
<td>CBA</td>
<td>27 474±6129</td>
<td>9.5</td>
</tr>
<tr>
<td>7</td>
<td>CBA+</td>
<td>CBA</td>
<td>3109±1541</td>
<td>1.0</td>
</tr>
<tr>
<td>8</td>
<td>C57BL+</td>
<td>C57BL</td>
<td>2897±863</td>
<td>1.0</td>
</tr>
</tbody>
</table>

EXPERIMENTAL METHOD

Male mice of strains CBA/H (H-2k, Mlsb), C57BL/6 (H-2b, Mlsb), and DBA/2 (H-2d, Mlsa), obtained from the "Stolbovaya" nursery, Academy of Medical Sciences of the USSR, and weighing 18-20 g were used.

Antireceptor antiserum (ARS) was obtained by immunizing intact CBA mice intravenously, twice at an interval of 2 weeks, with regional lymph node cells of CBA mice (10^8 cells per immunization), which had been given subcutaneous injections of 10^8 thymus cells of C57BL mice at 6 points 7 days before sacrifice. The mice were exsanguinated 10 days after the second immunization. A mixture of the blood sera of 15 mice was used in the experiments.

For lymphocyte culture in vitro, mouse spleen cells were kept for 4 days in silicone-treated penicillin flasks (5·10^6/ml) in 2 ml of culture medium of the following composition: 5% calf embryonic serum, 1% L-glutamine, 5·10^{-3} M HEPES, and 3·10^{-5} M 2-mercaptoethanol were added to RPMI-1640 medium. [3H]Thymidine (4 μCi, specific activity 1 Ci/m mole) was added to the medium 4 h before the end of culture. Proliferative activity of the cell suspensions was assessed by a radiometric method based on the incorporation of [3H]-thymidine into DNA of the proliferating cells, by means of a "Packard" scintillation counter in the usual way [4]. To assess the intensity of the blast transformation reaction the coefficient of stimulation was calculated by the formula a/b, where a is the number of counts in the experimental culture and b the number of counts in the control syngeneic cultures. Intact mouse spleen cells were used as the responding cells, and similar cells irradiated in a dose of 1500 R (^6Co γ rays, EKU-50 apparatus) as the stimulating cells. The ratio between responding and stimulating cells in the cultures was 3 : 7.

To assess the effect of the antisera on antigen-recognizing lymphocytes, before addition to the culture the responding cells were treated in vitro with antiserum in the presence of complement [5], after which the twice washed cells were added to the stimulating cells. All manipulations were carried out under sterile conditions in the cold.

Activity of the antisera also was tested in the lymphocytotoxic test by determining the viability of the cells with the aid of trypan blue [4].

Antilinear CBE anti-C57BL antiserum obtained by the usual method [5] and rabbit antiserum against mouse T lymphocytes also were used. The globulin isolated from this rabbit antiserum (ATG) was kindly provided by the Laboratory of Immunology of the Moscow Research Institute of Epidemiology and Microbiology, Ministry of Health of the RSFSR [1].

The specificity and high activity of the antilinear CBA anti-CBL serum and of the ATG were tested in the cytotoxic test and by their effect on cells producing antibodies against sheep's red cells [6]. In these tests the antilinear serum acted only against cells of C57BL mice and did not react with cells of CBA mice. ATG in the cytotoxic test caused death of 100% of thymus cells but did not affect bone marrow cells or antibody-forming cells. The cytotoxic test of the antilinear CBA anti-C57BL serum and of the ATG with thymus cells was 1 : 512 and 1 : 320 respectively.

EXPERIMENTAL RESULTS

It was first shown that, in agreement with data in the literature [10, 11], the responding cells in a mixed lymphocyte culture were T lymphocytes: Treatment of the responding cells with ATG inhibited blast transformation by 96%.