homologous fragment in rabbits. This fact can be regarded as evidence of correlation between the adjuvant properties of the Fab fragments and their ability to activate the complement system.

Since differences in complement-fixing activity between homologous and heterologous fragments could be detected in experiments in vitro, they are possibly attributable primarily to differences in their level of affinity for the corresponding homoreactants contained in rabbit serum. This explanation is likely to be correct because of differences in the structure of those regions of the molecules of the fragments compared that are responsible for interaction with the above-mentioned antiglobulin factors [2, 6].

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CHANGES IN THE BLOOD SERUM PROTEIN SPECTRUM OF MICE AFTER INJECTION OF A GLOBULIN PREPARATION CONTAINING HOMOLOGOUS TISSUE ANTIBODIES

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UDC 615.373.6:547.962.4/.015.4:612.124+612.124.014.46:615.373.6:547.962.5

The blood serum protein spectrum of mice differing in their initial resistance to malignant tumors was investigated by disc electrophoresis in polyacrylamide gel. Differences between different strains of mice were found in the zone containing immunoglobulins. The injection of a globulin preparation containing a high titer of normal tissue antibodies induced an increase in α_2-macroglobulin and β_1-lipoprotein, containing mainly IgM and also a certain quantity of IgG, in mice of the two lines tested.

KEY WORDS: homologous globulin; tissue antibodies; blood serum protein spectrum; immunoglobulins.

Previous experimental investigations have shown that injection of a preparation of homologous globulin containing normal tissue antibodies in high titer is an effective method of increasing the resistance of the recipient to growth of malignant neoplasms [3].

In the investigation described below the effects of this preparation on the blood serum protein spectrum were studied.

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(Presented by Academician of the Academy of Medical Sciences of the USSR N. N. Zhukov-Verezhnikov.) Translated from Byulleten' Éksperimental'noi Biologii i Meditsiny, Vol. 88, No. 8, pp. 177-179, August, 1979. Original article submitted March 2, 1979.

TABLE 1. Blood Serum Protein Spectrum of Intact Mice and Mice Receiving Globulin Preparation (relative percentages, M ± m)

Line of mice	Group of animals	Number of mice	Albumins	Postalbumins	Transferrins	Posttransferrins	spT/pT	α_2-Macroglobulin	β_1-lipoprotein
C3H	Intact	11	23,5±0,8	25,5±0,7	18,4±0,5	18,2±0,7	0,753±0,031	8,3±0,2	5,0±0,5
	Receiving globulin preparation from intact animals	11	25,0±0,8	22,2±0,9	20,2±0,6	17,6±0,6	0,621±0,018	9,6±0,4	4,3±0,5
	Experimental	11	24,9±0,6	24,3±1,1	18,3±0,6	14,1±0,9	0,600±0,080	10,3±0,4	7,9±1,1
C57BL/6	Intact	10	23,3±1,1	26,8±1,1	19,4±1,1	13,9±1,4	0,718±0,023	10,4±0,3	5,1±1,6
	Receiving globulin preparation from intact animals	12	24,1±1,2	27,3±1,8	19,5±1,4	13,5±1,4	0,571±0,030	9,8±1,3	6,0±0,9
	Experimental	11	24,6±0,8	23,7±1,1	21,6±0,8	12,4±0,8	0,600±0,019	11,9±0,5	8,0±0,9

EXPERIMENTAL METHODS

Experiments were carried out on 65 female mice of two lines differing in their initial resistance to spontaneous mammary gland tumors: C3H mice, predisposed to the development of spontaneous mammary gland tumors, and C57BL/6 mice, resistant to tumors in that situation. The animals used in the experiments were aged 6-7 months, i.e., before the appearance of spontaneous mammary gland tumors. The animals of the above lines were distributed among the following groups: 1) intact; 2) mice receiving the globulin preparation from intact animals, containing normal tissue antibodies in minimal concentrations; 3) mice receiving the globulin preparation from hemostimulated animals containing normal tissue antibodies in a high titer. The method of obtaining these globulin preparations and of determining their content of normal antibodies and of standardizing them were described previously [3]. Animals of groups 2 and 3 were injected subcutaneously with the preparations 3 times at intervals of 10 days, with a dose of 0.05 ml containing 1 mg protein each time. Blood was taken from the animals of all groups 10 days after the last injection. The blood serum protein spectrum was obtained by disc electrophoresis in Gusev's modification [2]. The blood serum of each animal was tested.

EXPERIMENTAL RESULTS

As Table 1 shows, during investigation of the blood serum protein spectrum of the intact mice of the two lines used, differing in their original resistance to carcinogenesis, differences were found in the content of individual protein fractions. For instance, in the C57BL/6 mice, resistant to the development of spontaneous mammary gland tumors, the concentration of α_2-macroglobulin was higher ($P < 0.001$) and the zone of post-transferrins was smaller ($P < 0.05$) than in the C3H mice.

To shed light on any possible change in the relative proportions of the fractions in the posttransferrin zone, the slow posttransferrins/transferrins ratio (spT/pT) suggested by Velik [1] was used. Since precipitation lines belonging to various classes of immunoglobulins and other proteins (for example, haptoglobin), are located in the posttransferrin zone, during quantitative evaluation of disc electrophoresis this zone was divided into the zone of slow posttransferrins, in which mainly IgA and to some extent IgG are concentrated, and the zone of fast posttransferrins, in which immunoglobulins are absent. The ratio spT/pT thus reflects the presence of IgA and, to some extent, of IgG quantitatively. This ratio in the present investigation showed no difference between the intact mice of the two lines. Consequently, the decrease in the posttransferrin zone in the blood serum of C57BL/6 mice was due to the lower protein concentration in this zone, while the corresponding relative proportions of their fractions remained the same.

After injection of the globulin preparation containing normal antibodies (antibodies whose production increases sharply during the first few hours after hemostimulation) in high titer, the blood protein spectrum of mice of both lines showed an increase in the quantity of α_2-macroglobulins ($P < 0.01$) and β_1-lipoprotein ($P < 0.05$) fractions.

α_2-Macroglobulin, which binds low-molecular-weight proteins (including, in particular, hormones and enzymes), is known to perform a transport function, whereas β_1-lipoprotein participates in the regulation of carbohydrate and fat metabolism. In addition, mainly IgM and, to some extent, IgG are located in the α_2-macroglobulin and β_1-lipoprotein fractions.

Under the influence of this preparation there was also a marked decrease in the value of the spT/pT ratio ($P < 0.05$). This was indirect evidence of a decrease in the concentrations of these immunoglobulins.

The globulin preparation from intact animals caused no significant changes in the α_2-M and β_1-lipoprotein fractions but lowered the spT/pT ratio. In the C3H mice there was also a fall in the postalbumin and β_1-lipoprotein levels, accompanied by a small increase in the concentrations of albumins and transferrins. These findings, indicating the greater mobility of the blood serum proteins under the influence of stimuli of immune nature in mice predisposed to the development of spontaneous mammary gland tumors than in resistant animals, can be used to study the mechanisms of formation of antitumor resistance.

The experiments described above thus showed that globulin from intact and hemostimulated animals, containing normal antibodies, may differ in its biological action on the body and, in particular, on the blood serum protein spectrum. An increase in the concentration of α_2-macroglobulin and β_1-lipoprotein fractions, which contain mainly IgM and, to some extent, IgG, taking place under the influence of the globulin preparation from hemostimulated animals, is one of the mechanisms of the antitumor action of normal antibodies.

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ENDOGENOUS COLONY FORMATION IN MICE UNDER THE INFLUENCE OF *Mycoplasma arthritidis* AND RAUSCHER LEUKEMIA VIRUS

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UDC 616-006-092.9-022.6

Mycoplasma arthritidis was shown not to affect endogenous colony formation in lethally irradiated BALB/c mice. The number of endogenous foci in mice irradiated in sublethal doses and infected with *M. arthritidis* was sharply increased when the mycoplasma was injected 24 h before or 4 h after irradiation. Mixed infection of $(C57BL/6 \times A/Sn)F_1$ mice resistant to Rauscher virus with this virus and mycoplasma led to a marked increase in the number of endogenous colonies in the early stages of infection. This phenomenon may perhaps lie at the basis of the loss of resistance in the hybrid mice and the appearance of leukemia in them as a result of mixed infection with mycoplasma and virus.

KEY WORDS: mycoplasma; Rauscher virus; endogenous colonies.

Mycoplasmas are generally accepted as the agents of various diseases of man and animals. The role of mycoplasmas has been demonstrated in certain autoimmune disorders and in leukemias. For instance, infection of $(C57BL/6 \times A/Sn)F_1$ mice, resistant to Rauscher virus, with that virus and *Mycoplasma arthritidis* leads to malignant erythroleukemia, whereas infection with the mycoplasma or the virus alone does not induce leukemia [1, 2]. The mechanism of induction of leukemia in resistant mice during mixed infection with mycoplasma and virus is not yet clear. The possibility cannot be ruled out that interaction between mycoplasmas and hematopoietic stem cells (HSC), which are the target cells for Rauscher virus, plays a special role in the development of this phenomenon.

The object of the present investigation was to study the effect of *M. arthritidis* and Rauscher virus on endogenous colony formation in mice.

EXPERIMENTAL METHODS

Mice of lines BALB/c, $(C57BL/6 \times A/Sn)F_1$, and C57BL/6 were used. The mycoplasmas and virus were obtained as described previously [1]. Cloning of hematopoietic cells was carried out in vivo in lethally irradiated mice by the method of Till and McCulloch [11]. BALB/c mice were irradiated in a dose of 750 rad, but the $(C57BL/6 \times A/Sn)F_1$ mice were irradiated in a dose of 920 rad; 4 h later each recipient received an intravenous injection of 0.5 ml of a suspension containing syngeneic bone marrow ($5 \cdot 10^4$) or spleen ($5 \cdot 10^5$) cells. The recipients were infected intraperitoneally with mycoplasmas (0.5 ml) at the same time; the maximal titer was 10^8 colony-forming units (CFU)/ml. Irradiated mice injected with medium 199 only or with

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(Presented by Academician of the Academy of Medical Sciences of the USSR O. V. Baroyan.) Translated from Byulleten' Éksperimental'noi Biologii i Meditsiny, Vol. 88, No. 8, pp. 179-181, August, 1979. Original article submitted August 18, 1978.

0007-4888/79/8808-0874$07.50