phagocytosis of the antigen[6,14] followed by transfer of cytoplasmic content as RNA or an RNA-antigen complex[14]. The demonstration of a direct cytoplasmic connexion between macrophages and antibody producing cells further established this concept[9]. Since no change in the RE function was apparent on the removal of the thymus, it is apparent that alterations in phagocytic activity of the RES are not involved in the immunological defects which follow neonatal thymectomy. The possible influence of thymectomy on other metabolic activities of the macrophage system remains to be established.

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Immune Response induced by RNA-Immunocarrier extracted from Heterologous Immune Sera

The importance of nucleoproteins in antibody-globulin production is well known[1,2]. In previous experiments[3,4] an evident increase of the content of RNA in the γ-globulin fraction in immune sera has been observed. The RNA extracted from the serum of immunized rabbits is capable of eliciting in normal rabbits the production of antibodies against the same antigens used for immunizing the animals from which this RNA-immuno-carrier (RNA-I-C) was taken. The following investigations were undertaken to ascertain whether an RNA-I-C extracted from the serum of immunized animals of one species was able to induce antibody production in animals of a different species.

Young male rabbits were immunized by 6–8 intravenous injections of red blood cells (RBC) of rat or guinea-pig. The RNA-I-C extracted[4] from sera of rabbits immunized with guinea-pig RBC was introduced into normal rats; normal guinea-pigs were treated with RNA-I-C obtained from sera of rabbits immunized with rat RBC. The amount of RNA introduced in each animal of both groups, by a single intracardiac injection, was 0·28 mg/100 g body-weight. At intervals of 24, 48, 72 and 96 h after RNA injection, blood samples were collected and the sera were subjected to hæmagglutination tests and macroscopic and spectrophotometric[4] hæmolysis tests.

Table 1. Immune Response of Rats treated with RNA from Anti-guinea-pig RBC Hyperimmune Rabbit Sera and of Guinea-pigs treated with RNA from Anti-rat RBC Hyperimmune Rabbit Sera

	Guinea-pig RBC		Rat RBC	
	Rats treated with anti-guinea-pig RBC RNA		Guinea-pigs treated with anti-rat RBC RNA	
	hæmagglutination	hæmolysis	hæmagglutination	hæmolysis
Controls	0	0	0	0
24 h	1 : 80	1 : 80	1 : 80	1 : 40
48 h	1 : 320	1 : 160	1 : 320	1 : 80
72 h	1 : 80	1 : 80	1 : 40	1 : 20
96 h	neg.*	neg.	neg.	neg.

* Negative is less than 10.

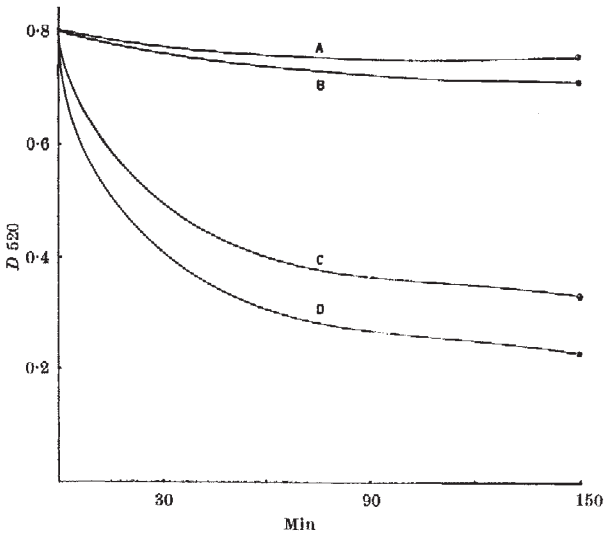

Fig. 1. Spectrophotometric behaviour of rat RBC or guinea-pig RBC hæmolysis by: *A*, normal rat serum; *B*, normal guinea-pig serum; *C*, serum from rat 48 h after injection of anti-guinea-pig RBC RNA; *D*, serum from guinea-pig 48 h after injection of anti-rat RBC RNA

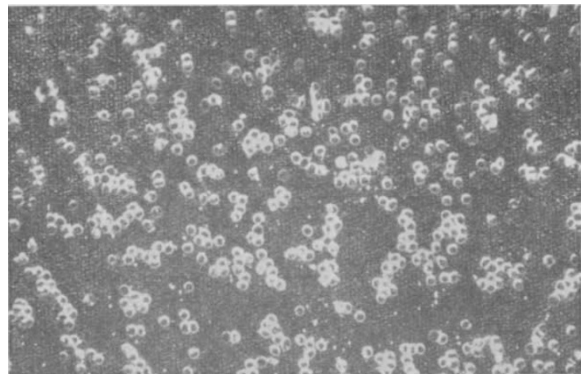

Fig. 2. Immunofluorescence test: guinea-pig RBC incubated at 37° C with serum (1 : 10) from rat 48 h after injection of RNA-I-C from rabbit anti-guinea-pig RBC sera, and then incubated with fluorescent anti-rat globulins

The results of hæmagglutinations and hæmolysis are summarized in Table 1. The kinetic behaviour of hæmolysis observed spectrophotometrically is shown in Fig. 1. The antigen-antibody reaction was also shown by the indirect immunofluorescent technique (Fig. 2). Check tests of RNA preparations were made by spectrophotometry in ultra-violet light.

The data confirm the possibility of eliciting an immune response by RNA-I-C extracted from the serum of immunized animals of a different species.

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