

# ANTIBODY-SYNTHESIZING FUNCTION OF THE MOUSE SPLEEN IN THE EARLY POSTNATAL PERIOD

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A study of the reaction of the spleen of line A mice to sheep's erythrocytes has shown that this organ can produce an immune response with effect from the 7th day of postnatal life. This coincides with the period at which the spleen acquires antigenic properties.

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Previous experiments [1] showed that the formation of spleen antigens in mice and rats is not completed in embryogenesis, but continues into the early postnatal period. The object of this investigation was to study the antibody-forming function of the mouse spleen at periods of their postnatal life when antigenic differentiation of the spleen takes place.

## EXPERIMENTAL METHOD

Mice of line A were immunized with sheep's erythrocytes on the 3rd, 7th, 10th, 14th, 30th, and 90th days of life. Between 18 and 20 animals were used at each time. Immunization was carried out intraperitoneally with a single dose of 0.02 to 0.2 ml of a 50% cell suspension in physiological saline depending on the body weight of the animals. On the 4th day after immunization mice of each age group were sacrificed, the spleen was removed and weighed, and a cell suspension was made in Hanks' solution, pH 7.0-7.2. The number of cells producing antibodies in the spleens was determined by the method of local hemolysis in agar as described by Jerne and Nordin [2]. The reaction was carried out with  $6.5 \cdot 10^6$  spleen cells.

Statistical analysis of the experimental results was carried out, using the Fisher - Student formula to test significance.

## EXPERIMENTAL RESULTS

After immunization of mice aged 3 days, hardly any antibody-forming cells were produced (Table 1). A marked immune reaction began to be visible on the 7th day after birth, for the number of antibody-synthesizing cells showed a statistically significant difference compared with the 3-day age group and normal unimmunized animals ( $P < 0.05$ ). On the 10th day after birth, although an increase in the level of antibody-synthesizing cells was observed, it was not statistically significant ( $P = 0.43$ ) compared with the 7-day group of mice. Later the level of antibody-synthesizing cells gradually increased, and in the group of animals aged 14 days the difference compared with the 7-day group was statistically significant ( $P < 0.05$ ). However, by the 14th day the antibody-synthesizing function of the spleen was still not fully developed, for the number of antibody-synthesizing cells in the adult animals was approximately twice as high (Table 1).

The number of antibody-synthesizing cells in the spleens of mice aged 1 month and in adult immunized animals was about equal.

The results thus show that the antibody-synthesizing function of the spleen becomes detectable in mice on the 7th day of postnatal life; the spleens of animals aged 1 month responded by antibody formation to injection of sheep's erythrocytes almost like the spleens of adult animals. These results are in agreement with those obtained by other workers [3] experimenting with rats.

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TABLE 1. Immune Response of Mouse Spleens at Different Periods of Postnatal Life

Age of mice (in days)	No. of antibody-synthesizing cells in spleen, in $\log (M \pm m)$
3	$0,23 \pm 0,03$
7	$1,03 \pm 0,17$
10	$1,36 \pm 0,15$
14	$1,60 \pm 0,09$
30	$2,90 \pm 0,03$
90	$3,24 \pm 0,07$
Control (unimmunized) mice	$0,41 \pm 0,07$

If these results are compared with those of investigation of the antigenic structure of the spleen in mice of the same ages, a definite relationship can be found between antigenic differentiation and the immunologic function of this organ.

It was on the 7th day that antigenic components began to appear in the tissues of the spleen which were absent or present in only small quantities in the spleen tissues of mice on the 1st day of life. At the same time, in their antigenic properties the spleens of mice aged 15 days differed from those of mice aged 7 days and were identical with the spleens of adult animals.

All these facts suggest that the antibody-synthesizing function of the spleen, an important antibody-producing organ, develops in mice after birth at about the same time as antigenic differentiation of the spleen takes place.

#### LITERATURE CITED

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