Cross-relations of *Escherichia* and Human Red Cells

It is well-known that certain strains of *Escherichia coli* (particularly 086:*B*7) are antigenically related to human red cell group A and group B substances. There have been differences in the results reported by different workers. Springer[1,2] found only anti-B activity in the sera of rabbits injected with *Escherichia coli* 086:*B*7 which was phenolized and then vacuum-dried. Using both living and treated preparations, Gonano *et al.*[3] showed both anti-A and anti-B activity, but in rather low titre, and their absorption studies gave rather disappointing results.

By the use of trichloroacetic acid extracts of *Escherichia coli* 086:*B*7, we were able to obtain sera with much higher anti-A and anti-B titres than resulted from the use of either formalinized or boiled-whole organisms. This suggests, *inter alia*, that the location of the antigens in the bacterial cell wall may be of importance[4]. The use of antigenic extracts also makes possible more detailed study of the antigenic relations and it is hoped to confirm and expand our impression that the cross-reacting *Escherichia* antigens are rather minor components of the cell.

B. J. Ten Raa
C. R. Macpherson

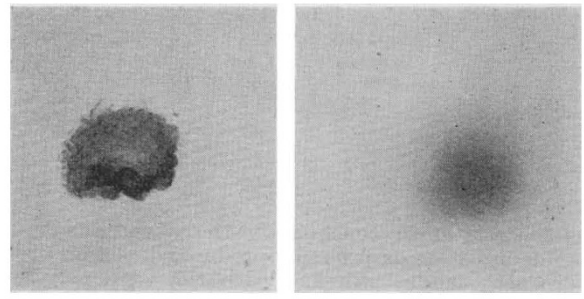
Department of Pathology,
Ohio State University,
Columbus 10.

[2] Springer, G. F., *J. Immunol.*, **76**, 399 (1956).
[3] Springer, G. F., *Acta Hæmatol.*, **20**, 147 (1958).
[3] Gonano, F., Modiano, G., and de Andreis, M., *Vox Sang.*, **6**, 683 (1961).
[4] Ten Raa, B. J., M.S. thesis, Ohio State Univ. (1963).

Male Specific Hæmagglutination in Mice

It has been found that male skin grafts are rejected by female mice in the *C57BL* strain[1]. On the other hand, it has been well ascertained that an introduction of the histocompatibility antigens into inbred mice can elicit humoral antibodies to cause hæmagglutination of the donor red cells. This communication shows that the sera of female mice sensitized with male tissues can agglutinate specifically blood cells of intact male mice. *DD* strain mice were used for experiments. The female animals were subjected to the following treatment: A subcutaneous injection of 0·2 ml. testis-Freund's adjuvant emulsion per week for 4–6 weeks. Each of the injections contained 15–33 per cent testis homogenate. One to two weeks after the last injection the antisera were collected from the sensitized female mice, and kept at −20° C until the use for the present hæmagglutination test.

Blood cells from the intact male or female mice were collected in heparinized Tyrode solution, washed twice with it, and finally with Tyrode solution adjusted to *p*H 7·35. These cells were suspended in Tyrode solution to 2·5 per cent. For the test, the antiserum was thoroughly mixed up with the blood cell suspension in equal volume on a hollow slide. The mixture was incubated at 18° C. After 90 min, the hæmagglutination reaction was examined. For control, similar tests were performed to all the conceivable combinations of the sera and the blood cells of the non-sensitized *DD* mice.



1 2

Fig. 1. Hæmagglutination of intact male blood cells suspended in antisera of female sensitized with testis; (1) positive (*j*—6 antisera × ♂*c* blood cell); (2) negative (*j*—6 antisera × ♀*c* blood cell)

Out of 40 sensitized females remarkable spleen hypertrophy occurred in 20 animals, of which 7 animals had clear hæmagglutinations. As shown in Table 1, the sera from these 7 specimens agglutinate the blood cells of all males tested, but fail to react with those of females, except in 2 cases (Fig. 1). It is worth mentioning that no instance of reverse reaction was seen at all. Every reaction shown in Table 1 was easily reproducible. In the control series, using sera from non-sensitized animals, no hæmagglutination was detectable at all.

These results may suggest that the testis homogenate used for the injection might contain male specific antigen(s), against which the recipient female mice can produce humoral antibody(s) to agglutinate the blood cells of the male mice specifically.

It is clear that the 7 antisera shown in Table 1 were able to discriminate male blood cells from those of female; in other words, some immunological characteristics of blood cells differ between the sexes. (Such an exceptional case as ♀*b* obviously needs further investigation.)

We thank Prof. S. Asayama of this University for his valuable criticism, and Prof. T. S. Okada of the University of Kyoto for his advice.

Mitsuru Furusawa
Minoru Kotani
Hiroshi Takeuchi

Department of Biology,
Faculty of Science,
Osaka City University,
Osaka.

[1] Eichwald, E. J., Silmser, C. R., and Wheeler, H., *Ann. N.Y. Acad. Sci.*, **64**, 737 (1957).

PATHOLOGY

Induction of Fibrosarcoma in the Primate *Tamarinus nigricollis*

Attempts to induce malignant neoplasms in monkeys have not met with the success that has been achieved in other species. The rarity of spontaneous neoplasms in monkeys suggests that these animals are more resistant

Table 1. Hæmagglutination caused by Antisera from the Female sensitized with Testis Homogenate in *DD* Strain Mouse

Antisera	Intact blood cell ♂								Intact blood cell ♀							
	a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*
c—1					+	+	−*	−*					−	−	−	−
h—1			+	+							+	−				
j—3		+ + +	+ + +		+ + +	+	±	+		+ + +	−		−	−	−	−
j—6		+ + +	+ + +		+ + +	+ +	±	+ +		+ + +	−		−	−	−	−
l—4	+								−							
n—1	+ + +								−							
n—3		+ +	+		+					+ +	−		−			

+ + +, + +, +, ±, Degree of hæmagglutination; −, absence of hæmagglutination.
* Absence of hæmagglutination may be due to weak agglutinating capacity of the antiserum (*c*—1).