

produced by acute hemorrhage. The determination of the chylomicrons, therefore, cannot be taken as an index of the total fat in the blood.

That the chylomicrons are associated with the fats in the blood is confirmed.

### 230 (2190)

#### A hitherto undescribed pair of isoagglutination elements in human beings.

By ARTHUR F. COCA and H. KLEIN.

[From the Department of Bacteriology and Immunology, Cornell University Medical College and the New York Hospital, New York City.]

Landsteiner, in 1901, discovered three human blood groups, and soon afterward, Decastello and Sturli, pursuing the study with Landsteiner's knowledge and encouragement, found the fourth group. Landsteiner recognized the existence in human serum of two isohemagglutinins, which were designated with small letters a and b, or (by von Dungern and Hirschfeld)  $\alpha$  and  $\beta$  and two isoagglutinable substances in the corpuscles which were called A and B.

Quite recently Guthrie and Huck have reported the discovery of a third pair of isoagglutination elements, which, to bring the terminology into conformity with the previously existing one, we will refer to as isoagglutinin c and agglutinable substance C.

The relation of the exceptional individuals observed by Guthrie and Huck to the original four blood groups is shown in Table I.

	TABLE I.			
Groups .....	I	II	III	IV
Serum .....	a. b.	b	a	.....
Corpuscles .....	.....	A	B	A. B.
Guthrie and Huck.....		b A. C.	c B	

In the course of a class demonstration of the two original pairs of isoagglutination elements, the serum of one of us (A. F. C., a Group I individual) was absorbed, first with the washed corpuscles of a Group II individual (Levine) and then with the washed corpuscles of a Group III individual (Sutton). The supernatant fluid, after these absorptions, no longer clumped the corpuscles of the respective Group II and Group III individuals, but still possessed a vigorous power of agglutinating the corpuscles of a Group IV individual (Johnson) which were agglutinable by the serum of both Levine and Sutton.

This observation indicated the presence of another undescribed pair of isoagglutination elements, which we shall tentatively designate as x (isoagglutinin) and X (isoagglutinable substance).

Examination of 10 other Group I sera revealed the presence of "x" in 7 of them (see Table II).

It is evident that the agglutinable substance "X" is lacking in the Group II and Group III corpuscles that were used for the absorption. Six other Group III corpuscles have been examined and all were found to lack the agglutinable substance "X." Of 13 other Group II corpuscles only 2 have been found to lack this substance.

No other Group IV corpuscles have been available.

Six Group III sera have been examined and of these, 2 have been found to possess the isoagglutinin "x;" the other 4 lacked it.

TABLE II.

Group I Sera.	Unabsorbed		After absorption with L and S corpuscles		
	tested with corpuscles of		tested with corpuscles of		
	L	S	L	S	J
1 (A.F.C.)	++	++	0	0	++
2	+++	+++	0	0	++
3	++	++	0	0	++
4	++	++	0	0	0
5	+++	+++	0	0	++
6	+	+	0	0	++
7	++	++	0	0	++
8	+++	+++	0	0	++
9	++	++	0	0	++
10	++	++	0	0	0
11	++	++	0	0	0

L = P. Levine (Group II lacking agglutinable X).

S = H. B. Sutton (Group III).

J = S. Johnson (Group IV).

+ = agglutination.

TABLE III.

Groups .....	I	II	III	IV
Serum .....	a. b. x.	b	a. c. x.	.....
Corpuscles .....	.....	A. C. X.	B	A. B. X.

According to our present knowledge the constitution of the four blood groups, including the two new pairs of elements, may be represented as in Table III.

The possibility of this pair of isoagglutination elements being identical with that described by Guthrie and Huck must be considered. The study will be pursued and a detailed report will be made in the *Journal of Immunology*.

### 231 (2191)

#### A dangerous "universal donor" detected by the direct matching of bloods.

By PHILIP LEVINE and JENNIE MABEE (by invitation).

[From the Department of Bacteriology and Immunology, Division of Immunology in Cornell University Medical College, and the New York Hospital.]

In cases of transfusion where it is difficult to obtain a donor of the same group as the patient, a person of Group I (Jansky) has been considered suitable on account of the fact that the corpuscles of this group are inagglutinable by the isohemagglutinins. The fact that the plasma of a Group I individual contain isoagglutinins capable of clumping the corpuscles of the recipient has been ignored, because, under ordinary circumstances, the quantity of the plasma transfused is too small to affect the larger proportion (five to ten times) of the recipient's corpuscles.

In carrying out the method of direct matching of bloods described by Coca,<sup>1</sup> we found that the plasma of one of us (M., Group I) produced complete agglutination of ten volumes of the corpuscles of P. L. (Group II). Quantitative tests in the

<sup>1</sup> Ref. *Journal of Immunology*, 1918, 93-100.