

Fibrinogen  
composition. the  
groups are denoted  
by the



**ASSIGN  
BUSTER**

Fibrinogen found in plasma causes clotting in whole blood when the coagulating and coagulable elements are removed from the plasma, a clear fluid is obtained. This is serum. 2. Red Cells:

**(i) ABO system:**

(a) Blood Groups: The theory that all human beings fall into four principal blood groups according to their composition. The groups are denoted by the letter A, B, AB and O. There are several sub-groups of A the four main groups are determined by the fact that the blood corpuscles of certain individuals react upon the serum or plasma (fluid part of blood) of certain other individuals and this causing agglutination or clumping together of the red blood cells. These substances in the corpuscles are called antigens.

Two types of antigens, denoted by the letters A and B, have been distinguished. Again the substances present in the serum with which antigens react are also of different natures, and they are distinguished as anti-A and anti-B. The two antigens A and B may be present together as in blood group AB, or be altogether absent as in blood group O, or be present singly as in blood group A or blood group B. (b) Blood Groups A, B and O: To which group a person belongs can easily be found out by mixing a drop of his blood with known blood sera A and B. If the red blood corpuscles agglutinate in A serum he belongs to group B; if the red corpuscles agglutinate in B serum he belongs to group A; if agglutination occurs in both A and B, he belongs to group AB and if agglutination does not place either in A or B, he is a member of group O.

(c) Universal Donor and Universal Recipients: People of O group are known as 'universal donor', blood can safely be transfused to persons of any blood

group; while people of AB group are tall 'universal recipients', as they can safely receive blood of any group. A blood can be given on persons of A or AB groups and B to persons of B or AB groups only. AB can be transfused to AB persons only.

**(ii) Genotypes and Phenotypes of Blood Groups:**

The heredity of blood groups is fully known.

The allelic genes which can occupy the same a certain chromosome are responsible for hereditary mechanism. It seems that O is race both A and B. Hence out of six genotypic combinations OO, AA, BB, AO, BO, AB, four pence blood group O, A, D, AB are distinguished. Applying some formulae gene frequencies of groups can also be calculated.

It has been found that antigen A is separable to two distinct antigens—A1 and A2. Anti-A antiserum react with both antigen A1 and antigen A2.

Antiserum is very rare. It reacts only with antigen Anti-A1. There is no anti-A2 serum. Therefore, the genotype A2 cannot be detected at present. A1 and A2 are inherited as discrete and separate traits.

A1 is dominant over A2 and also over O. A2 is also dominant over O. For classification of A1 and A2 blood samples, the following procedure is adopted. If red cells are agglutinated by anti-A and anti-A2 antis era, then the blood sample is classified as A,; and if no such reaction is observed it is classified as A2. Genotypes and Phenotypes with A1 and A2: Now instead of three alleles we are to take into consideration four alleles while dealing with ABO blood group system. As a result we find ten genotypes and six

phenotypes as shown below: Genotypes and phenotypes in the ABO blood group system with Antigens A1 and A2.