

Basic antigen-antibody reactions

Agglutination

Hemagglutination Is Used in Blood Typing

Introduction

Agglutination results when homologous antibody reacts with particulate antigen, principally cells such as bacteria, erythrocytes. With appropriate conditions, such a reaction produces visible results because of the formation of a lattice. The lattice is composed of antibodies bridged between antigens. A large number of epitopes are present on the surface of a cell. IgG are good agglutinating antibody.

Agglutination reactions are useful in typing blood, determining antibody titers of sera, and identifying bacterial cells. This highly sensitive method has been adapted for many clinical procedures.

Blood grouping by Agglutination:

Why Blood Typing Is Done

Blood typing is done prior to a blood transfusion or when classifying a person's blood for donation. Blood typing is a fast and easy way to ensure that you receive the right kind of blood during surgery or after an injury. If you are given incompatible blood, it can lead to blood clumping, or agglutination, which can be fatal. Blood typing is especially important for pregnant women. If the mother is Rh- and the father is Rh+, the mother and child will have different blood types. In these cases, the mother needs to receive a drug called Rho GAM. This drug will keep her body from

attacking the baby's blood cells if their blood becomes mixed, which often happens during pregnancy.

The presence of isoantigens must be determined prior to blood transfusion to eliminate the possibility of hemoglobinurea or other serious transfusion reactions. These reactions generally occur when recipient antibodies react with transferred erythrocytes. Such a reaction in the vascular system of the recipient may result in death.

Typing of erythrocytes for ABO type involves having a blood specimen and two isoantibodies ,anti-A and anti-B. A drop of blood to be tested is placed on a slide and mixed with a drop of anti-A. Another drop of blood is mixed with anti-B. Within a few minutes the agglutination reaction is complete if homologous antigens and antibodies are present. If the A antigen is present, red blood cells will be agglutinated by anti-A .

Some individuals have another important red blood cell antigen called the Rh antigen. Also important in transfusion reactions, it can be detected with anti-Rh antiserum. A drop contain Rh positive erythrocytes and a drop of anti-Rh antiserum mixed on a warm slide will result in agglutination.

Materials:

A. Blood typing

Lancets

Alcohol swabs

Microscope slides

Anti-A typing serum

Anti-B typing serum

Anti-Rh (anti-D) typing serum

Adhesive bandages

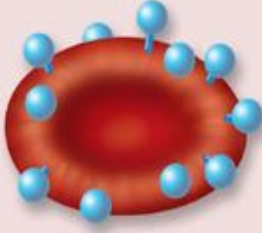
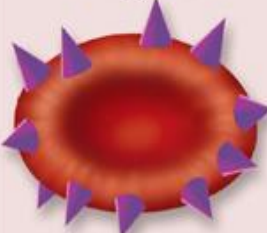
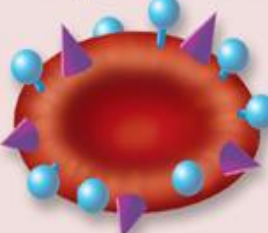




Procedure

ABO Blood Typing:

1. Secure clean microscope slides.
2. Divide a slide in half with a marking pencil. One end will be used to test for A antigen, the other for B antigen. Label the slide appropriately.
3. Prick your finger and place a drop of blood on each half of the slide.
4. Quickly add a drop of anti-A typing serum to one drop of blood and a drop of anti-B typing serum to the other.
5. Mix each with a clean wooden applicator or rotate the slide on a serological rotating device to enhance the reaction.
6. Observe for agglutination within 2 min.

Rh Blood Typing:

1. Follow the procedure given above for obtaining a drop of blood and place it on a microscope slide.
2. Quickly add a drop of anti-Rh (anti-D) antiserum.
3. Mix as above or rotate or place on a serological rotator and read the results within 2 min.

ABO Blood Types				
	Antigen A	Antigen B	Antigens A and B	Neither antigen A nor B
Erythrocytes				
	Anti-B antibodies	Anti-A antibodies	Neither anti-A nor anti-B antibodies	Both anti-A and anti-B antibodies
Plasma				
Blood type	Type A Erythrocytes with type A surface antigens and plasma with anti-B antibodies	Type B Erythrocytes with type B surface antigens and plasma with anti-A antibodies	Type AB Erythrocytes with both type A and type B surface antigens, and plasma with neither anti-A nor anti-B antibodies	Type O Erythrocytes with neither type A nor type B surface antigens, but plasma with both anti-A and anti-B antibodies

Blood being tested

Serum

Type AB (contains agglutinogens A and B; agglutinates with both sera)

Type A (contains agglutinogen A; agglutinates with anti-A)

Type B (contains agglutinogen B; agglutinates with anti-B)

Type O (contains no agglutinogens; does not agglutinate with either serum)

