

Serological test

Serological test : are immunological tests that used the blood serum for evidence of infection & other parameters by evaluating antigen-antibody reaction in vitro.

Classification of serological test

1-**primary serological test (Marker techniques)** : e.g Enzyme-linked immunosorbent assay (ELISA) , immunofluorescent - antibody techniques (IFAT)

2-**Secondary serological tests** : e.g Agglutination test , precipitation test , Neutralization test , Complement fixation test

Antibody (**anti**-foreign **body**) is a protein produced by a white cell (B lymphocyte) / as response to foreign antigens (substances).

Antigen (**anti**body **gen**erating substance) is any agent, such as a chemical or microorganism that is recognized by the antibody

classes of IGs

a. IgM

(first exposure , large , not passing placenta , huge amount)

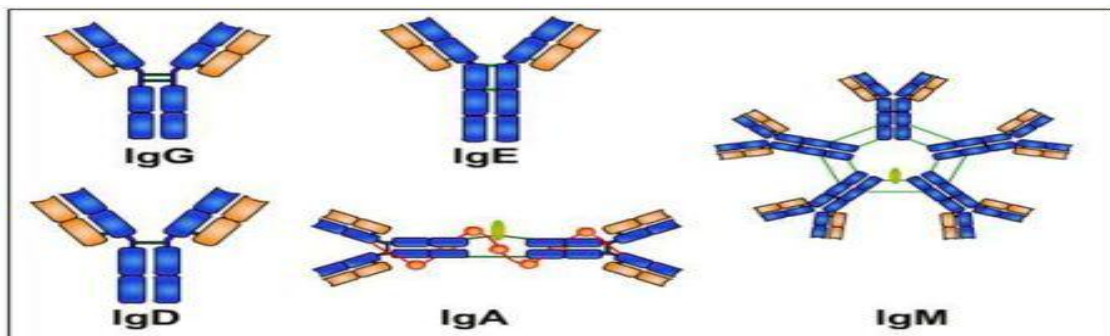
b. IgG (secondary exposure , small , passing placenta)

c. IgA (mucosal immunity , respiratory tract)

d. IgE (Allergy and parasites)

e. IgD

(proteins in the plasma membranes of mature B lymphocytes , same time as IgM)

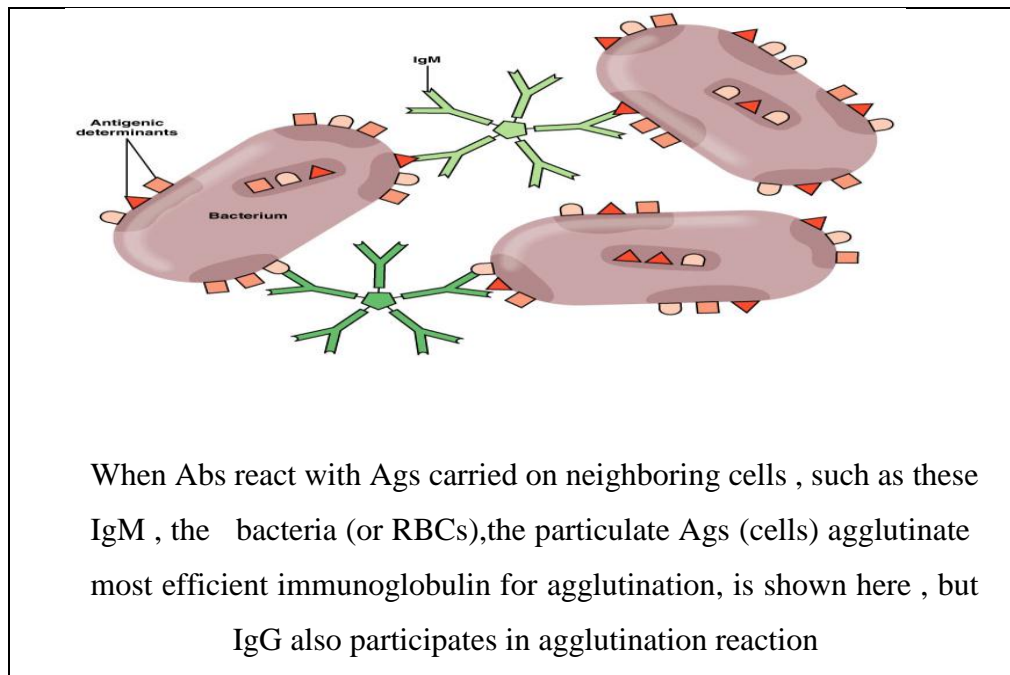


Agglutination reaction

Immunological reactions that involve the reaction of either particular Ag (particles such as cells that carry antigenic molecules) or soluble antigens adhering to particles , these Ags can be linked together by Abs to form visible aggregate called (clumps) .

Agglutination tests are classified as either **Direct** or **Indirect** agglutination

1-Direct agglutination tests : These used of **Abs** against relatively large cell such as those on red blood cell , bacteria & fungi these tests can be done either in Microscopic slide or in series of test tubes or plastic microtiter plat these tests are used for diagnosis of brucellosis (Rose Bengal test) or diagnosis of Salmonellosis–typhoid fever (Widal test)



2-Indirect (passive) Agglutination test








Abs against soluble Ags can be detected by agglutination tests if the Ags are adsorbed on to particles such as bentonite clay, or most often, minute (latex spheres) each about one tenth of the diameter of bacterium such test known as (latex agglutination tests) are commonly used for the rapid detection of serum Abs Against many bacterial & viral diseases. In such indirect (passive) agglutination test the Abs reacts with the soluble Ag adhering to the particles, the particles then agglutinate with one another, much as particles in the direct agglutination tests the same principle can be applied in reverse by using particles coated with Abs to detect the Ags which they are specific. approach is especially common in tests for the streptococci that cause sore throats, A diagnosis can be completed in 10 minutes.

Advantages

- 1-Easy to carry out
- 2-No complicated equipment needed
- 3-Can be performed as needed
- 4-Available in pre-package kits with controls
- 5-Reactions are Qualitative , i.e., positive or negative

Hemagglutination

Its agglutination reaction which involve the clumping of RBCs , these reaction which involve RBCs surface Ags & their complementary antibodies are used routinely in blood group typing.

The ABO Blood System				
Blood Type (genotype)	Type A (AA, AO)	Type B (BB, BO)	Type AB (AB)	Type O (OO)
Red Blood Cell Surface Proteins (phenotype)	 A agglutinogens only	 B agglutinogens only	 A and B agglutinogens	 No agglutinogens
Plasma Antibodies (phenotype)	 b agglutinin only	 a agglutinin only	NONE. No agglutinin	 a and b agglutinin

Viral Hemagglutination

Certain viruses , such as those causing (mumps , measles & influenza) have the ability to agglutinate erythrocytes (red blood cells) without an Ags-Abs reaction these process is **Viral Hemagglutination** these type of hemagglutination can be inhibited by Abs that neutralize the

agglutinating virus so this type of diagnosis test it will be discuss in neutralization reaction

