Serological test

Numerous types of serologic tests differ in their speed and sensitivity. Some are strictly qualitative, others are quantitative.

These Tests include

1.Precipitation

2.Agglutination

3.Neutralization

4.Complement fixation

5.Immunofluorescence

6.Radioimmunoassay (RIA)

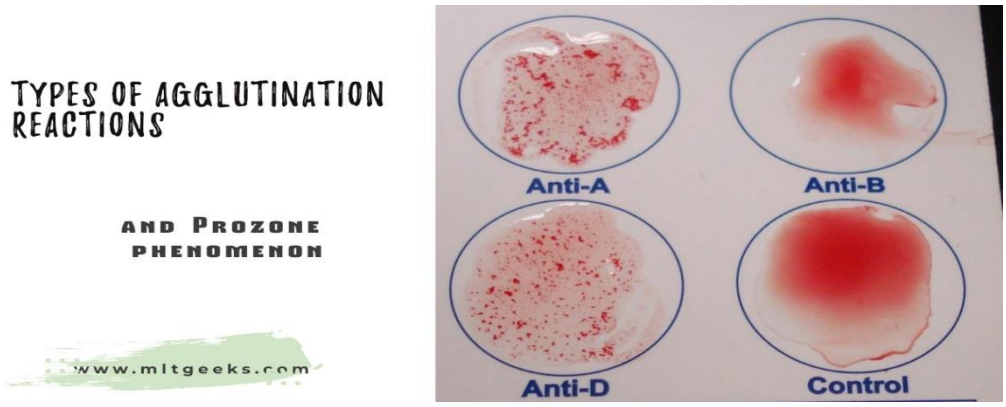
7.Enzyme-Linked Immuno sorbent Assay (ELISA)

8.Western Blotting

Agglutination: When the specific antibodies (agglutinins) bind to surface antigens of bacteria/virus or any antigens immobilized in particulate matter (such as latex particle) and cause the formation of a visible clumps, such test is called agglutination.

Agglutination test can be performed in:

- Surface of glass slides: Rapid reading
- Test tubes: More sensitive because of longer incubation



Factor affecting on the agglutination reaction in vitro

1. Antigen to antibody ratio

- The ratio between antigen and antibody influences the detection of antibody-antigen complexes.
- Antigen or antibody excess make invisible reaction.

Agglutination Methods

a. Prozone phenomenon (antibody access)

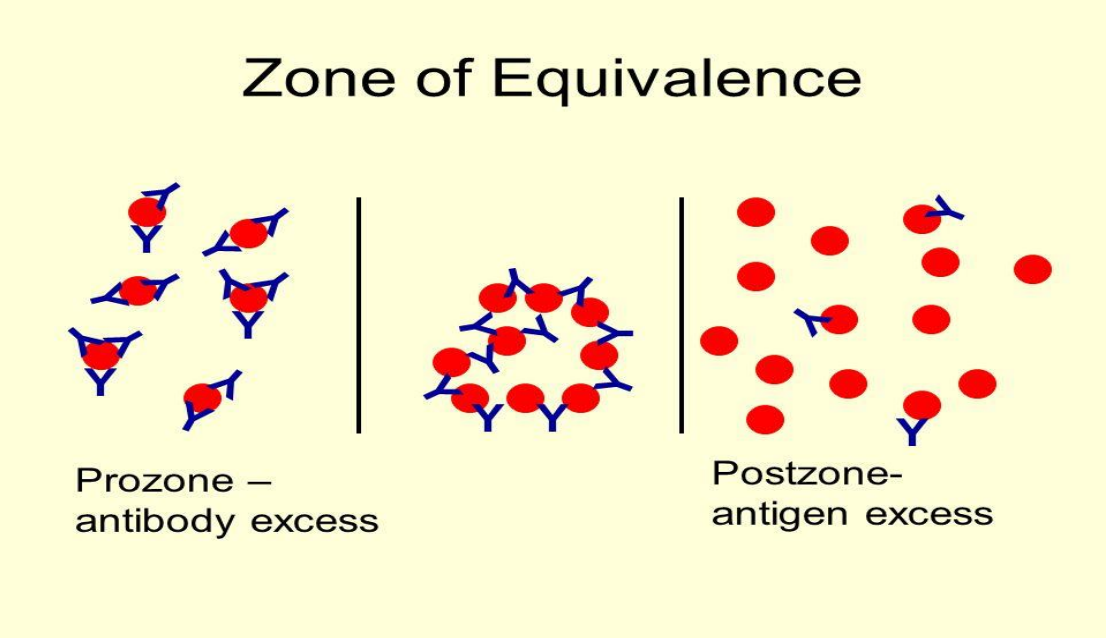
- There are too many antibodies.
- Antibodies saturating all antigen site
- No antibodies forming cross-linkages between cells or particles so, no agglutination appears (false- negative reactions).

b. Zone of equivalence

- Antibodies and antigens are present in an optimum ratio.
- This leads to cross-linkages between cells or particles, so agglutination appears (positive reaction).

c. Post-zone phenomenon (Antigen excess)

- There are too many antigens
- Any agglutination is hidden by masses of agglutinated antigens that give false-negative reactions.



2. **Number of Antigen sites**
   - ❖ The more antigen sites on a cell result in more cross-linkages between cells.
   - ❖ These cross linkages result in more visible agglutination.

Classification of agglutination reactions

1. **Direct agglutination reactions**

   RBC(Ag)+specific Ab=agglutination

Examples

ABO blood group typing

Rh(D) Ag

2. Indirect Agglutination

Patient serum Ab(IgM)+ soluble Ag adsorbed particle= agglutination

- ❖ Passive agglutination is a very sensitive method for antibody detection.
- ❖ RBC, bacterial cells or inert particles such latex can be used as a carrier for soluble antigens.
- ❖ The soluble antigen is absorbed onto the carrier cell or particle, then reacted with the specific antibody.
- ❖ This makes the reaction more visible than precipitation.