

Experimental animals in the immunological laboratory:

Animal experiments are the use of animals in scientific research to find new therapy against diseases.

- **The purpose of use animals in the immunological lab:**

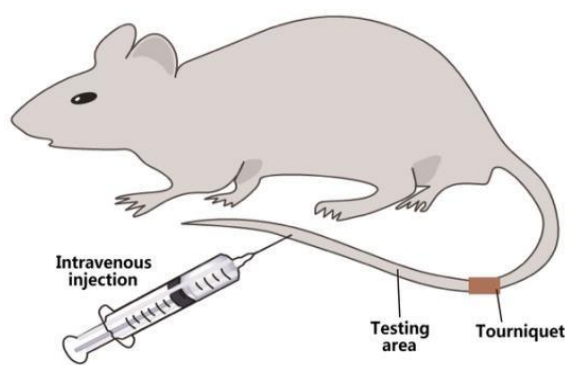
- ✓ To study the immunological and pathological processes.
- ✓ To study the antigenicity of vaccines.
- ✓ For antibody production.

- **Types of experimental animals:**

- ✓ Mammalians such as rats, mice, rabbits, cats, monkeys, dogs, pigs, and sheep, etc.
- ✓ Non-mammalian vertebrates such as chickens, snakes, frogs, and fish, etc.

❖ Routes of injection:

Intravenous injection (IV)



Intramuscular injection (IM)



Intraperitoneal injection (IP)



Subcutaneous injection (SC)



❖ Blood collection:



Cardiac puncture



Auricular artery

Antigen-Antibody Interaction

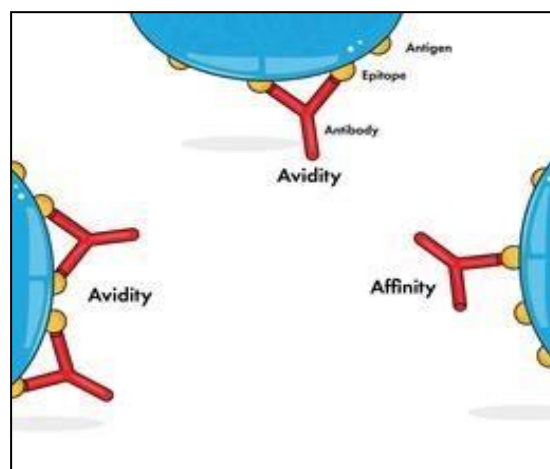
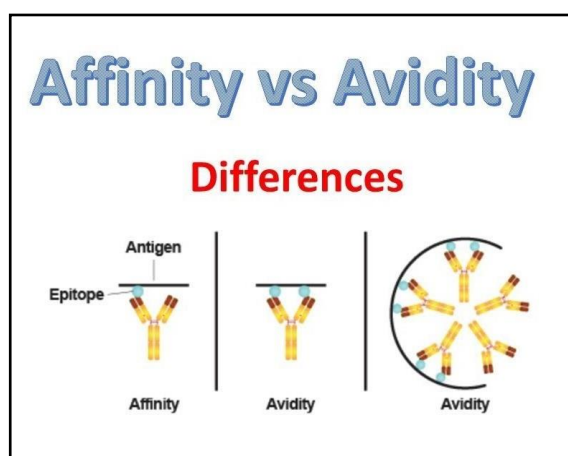
- Most of the serological testing requires the interaction between antibodies and antigens to form a visible antibody-antigen complex.
- The primary combination of binding sites on an antibody with specific epitopes on an antigen depends on two characteristics of antibody known as **affinity** and **avidity**.

Affinity:

The initial force of attraction that exists between a single site on an antibody and a single epitope site on the antigen.

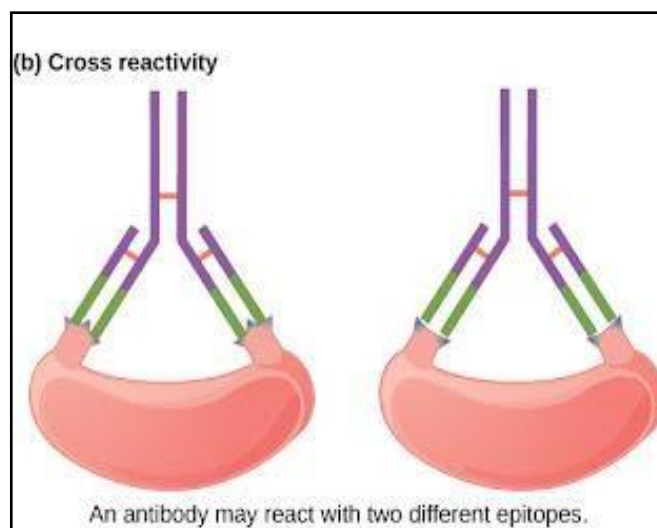
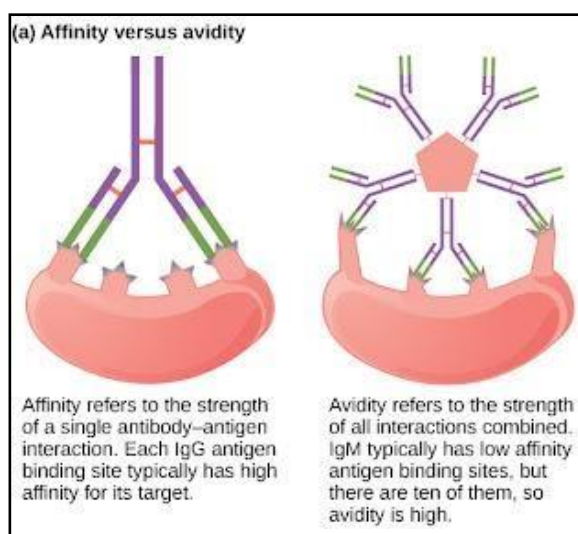
Avidity:

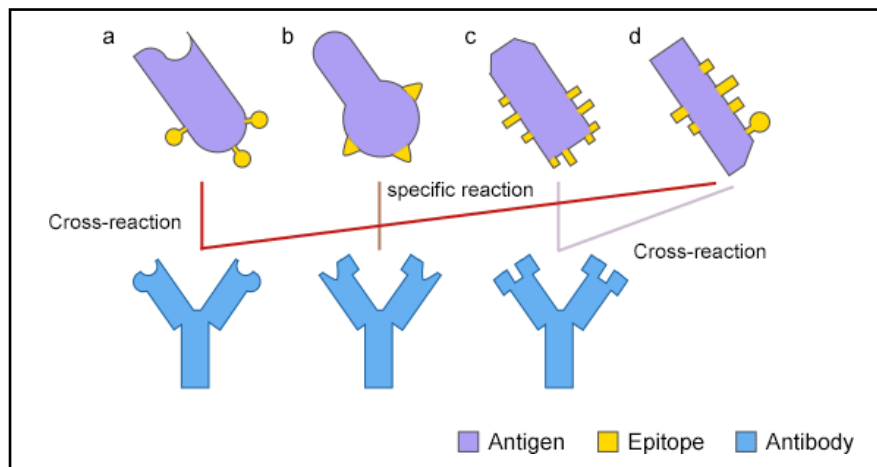
The force of antigen-antibody binding when multiple binding sites of an antibody interact with multiple epitopes on an antigen.



Cross-reactivity

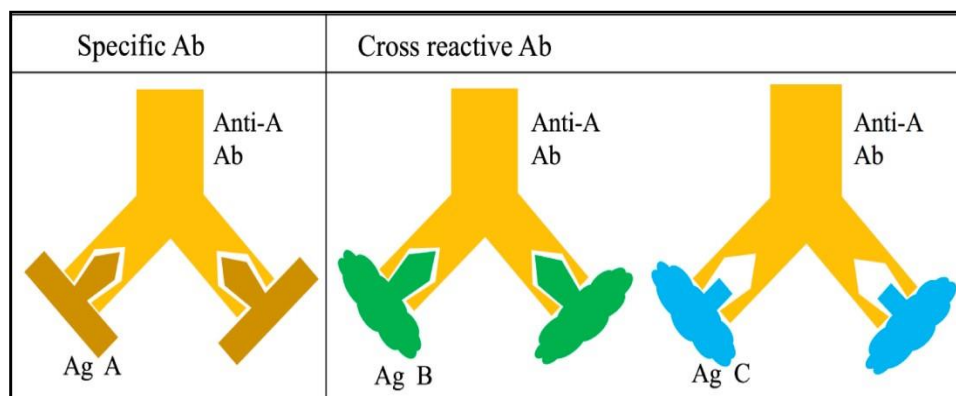
The ability of the antibody to react with two or more antigens that possess a common epitope.





Specificity

The ability of the antibody to react with a single antigenic determinant (epitope).



Non-covalent Bonds:

The bonds that hold the antigen to the binding site on the antibody are non-covalent bonds include **hydrogen bonds**, **electrostatic bonds**, **Van der Waals forces**, and **hydrophobic bonds**.