SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)
COIMBATORE-35
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UNIT III: GENETICS AND IMMUNE SYSTEM

TOPIC: **Antigens-antibody-immune response**

TOPIC OUTLINE

INTRODUCTION:

- The antigens and the antibodies combine specifically with each other. This interaction between them is called Antigen-Antibody reaction.

- It may be abbreviated as Ag – Ab reaction.

- These form the basis for humoral immunity or antibody mediated immunity.

- These reactions form the basis for detection of infectious disease causing agents and also some non-specific Ag's like enzymes.

- When Ag – Ab reactions occur invitro, they are known as serological reactions.

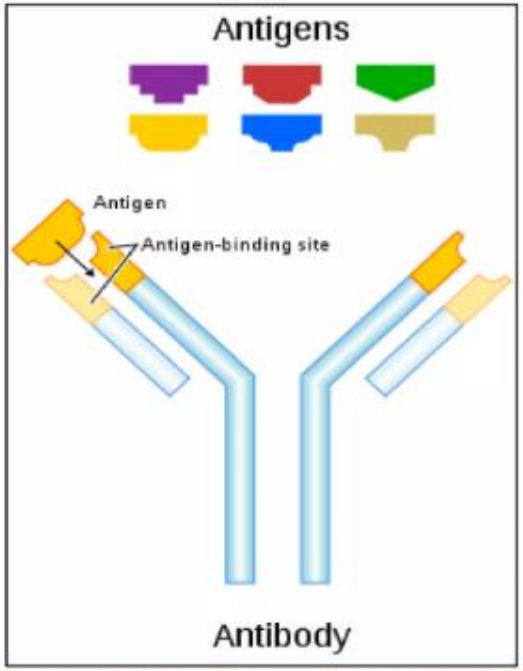
- The reactions between Ag and Ab occur in three stages.
  - In first stage the reaction involves formation of Ag-Ab complex.
  - The second stage leads to visible events like precipitation, agglutination etc.
  - The third stage includes destruction of Ag or its neutralization

Salient Features of Antigen – Antibody Reaction:

- Specificity of Antigen – Antibody Reaction.
- Immune complex.
- Binding Site of Antigen – Antibody Reaction.
- Binding Force of Antigen – Antibody Reaction.

Specificity of Antigen – Antibody Reaction:

- Specificity refers to the ability of an individual antibody combining site to react with only one antigenic determinant or the ability of a population of antibody molecules to react with only one antigen.



Each antibody binds to a specific antigen; an interaction similar to a lock and key.

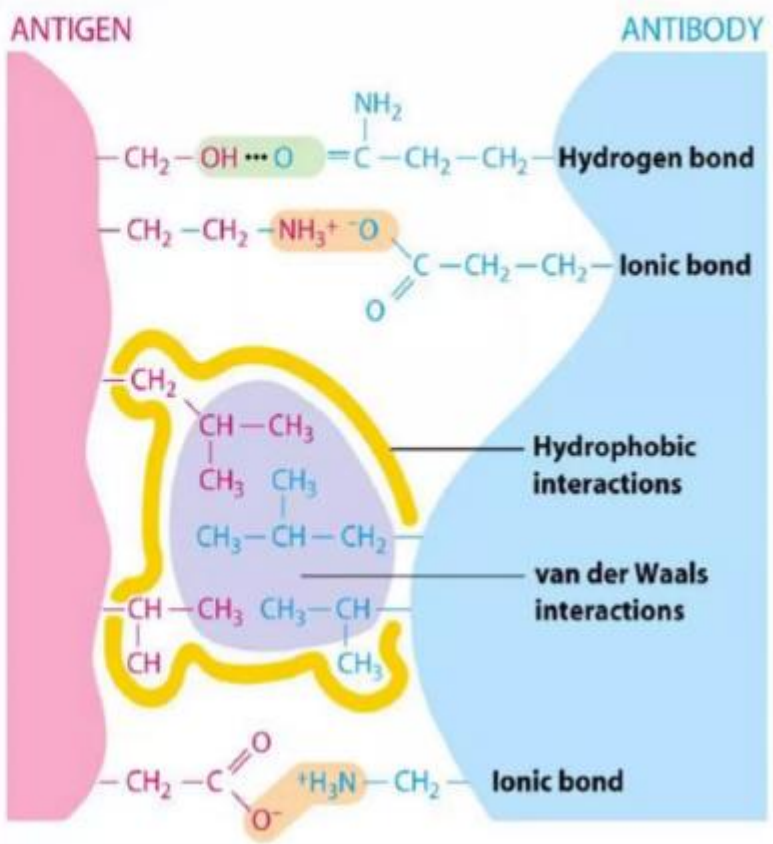
- Closeness between antigen and antibody: When antigen and antibody are closely fit, the strength of binding is great. When they are apart binding strength low.

- Non – Covalent Bonds: The bonds that hold the antigen to the antibody combining site are all non-covalent in nature. These include hydrogen bonds, electrostatic bonds, Van der Waals forces and hydrophobic bonds.

- Affinity of antibody: Antibody affinity is the strength of the reaction between a single antigenic determinant and a single combining site on the antibody.

Strength of Antigen – Antibody reaction:

- The non – covalent interaction that form the basis of antigen – antibody binding include hydrogen bond, ionic bond, hydrophobic interaction and Van der Waals interaction.



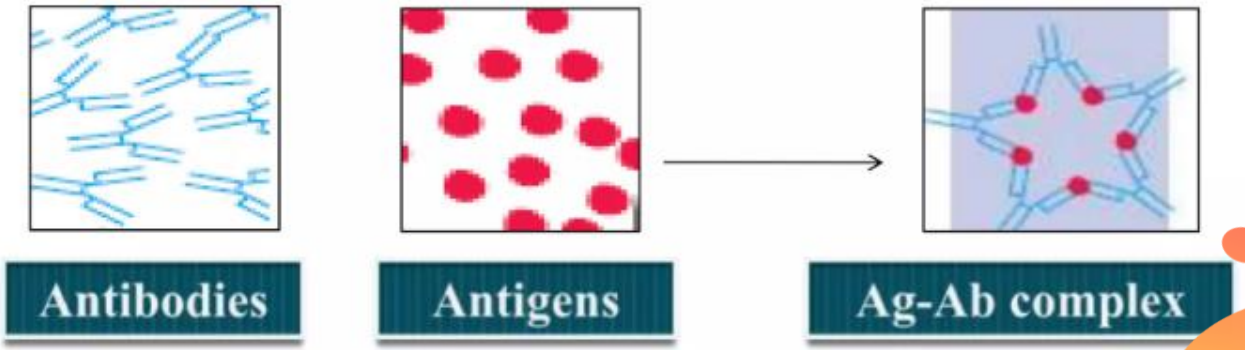
Types of Antigen – Antibody Reaction:

The types of antigen – antibody reactions are:

- **Precipitation Reaction.**
- **Agglutination Reaction.**
- **Complement Fixation.**
- **ELISA – Enzyme Linked ImmunoSorbent Assay.**
- **Immunofluorescence.**

Precipitation Reaction:

When a soluble Ag combines with its Ab in the presence of an electrolyte (NaCl) at a particular temperature and pH, it forms an insoluble precipitate of Ag-Ab complex. The Ab causing precipitation is called Precipitin and the reaction is called as precipitation reaction.



RECAP….

…THANK YOU