

Antibody (Ab)

An antibody is a component that the immune system produces in response to antigens. Thus, antigens result in the production of antibodies. They act together to exhibit an immunological response. The general characteristics of an antibody are as follows:

- An antibody is also known as an immunoglobulin (Ig)
- They are Y-shaped
- Glycoproteins
- Generated by plasma B-cells.
- Paratope is the name of the antigen binding site.
- Five types: IgG, IgA, IgM, IgE, and IgD.

Antigen-Antibody Reaction

Antigens and antibodies combine specifically with each other. Antigen-Antibody reaction is the term used to describe this interaction between them. Ag-Ab reaction is a common acronym for it. These serve as the building blocks of humoral or antibody-mediated immunity.

These reactions serve as the foundation for the detection of both specific and non-specific Ags, such as enzymes that cause non-specific diseases. Serological reactions are referred to as Ag-Ab reactions when they occur in vitro.

Stages of Antigen-Antibody Reaction

There are three stages to the interactions between Ag and Ab.

- The first stage of the reaction entails the formation of the Ag-Ab complex.
- The second stage results in visible phenomena like agglutination, precipitation, etc.
- The third stage involves the destruction of Ag or neutralisation of Ag.

Properties of Antigen-Antibody Reaction

- Significantly specific reaction
- Occurs in a noticeable manner
- Non-covalent reactions (Ionic bonds, Van der Waals forces, Hydrophobic interactions, Hydrogen bonds)
- Antibodies and antigens are not denatured
- Reversible
- Affinity: This refers to how strongly an antigen binds to a certain antigen-binding site on an antibody.
- Avidity: It is a more general concept than affinity. It represents the Ag-Ab complex's total strength. It depends on:
 1. The antibody's affinity
 2. Antibody and antigen valencies (the number of binding sites)
 3. How epitopes and paratopes are structurally arranged.