

Difference Between Antigen and Immunogen

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Key Difference - Antigen vs Immunogen

Immunology is a branch of medicine and biology and is concerned about all aspects of the immune system in organisms. This is a much studied as it is vital to identify and assess the manner in which an organism protects itself against a foreign invasion. An immunological response is initiated upon the entry of a foreign entity which results in a cascade of reactions downstream to degrade or eliminate the foreign entity. An antigen is a foreign body or a molecule, which has the ability to bind to the antibody produced by the host in response to the recognition of the antigen. An immunogen is also a foreign molecule which can elicit an immune response by triggering the host immune system. The **key difference** between the antigen and the immunogen is **their ability and the inability to generate an immune response;an immunogen is necessarily an antigen, but an antigen may not necessarily be an immunogen.**

What is an Antigen?

Antigens are small molecular recognition sites present in the cellular surface of many bacteria, fungi, viruses, dust particles and other cellular and noncellular particles. These small molecules referred to as antigens, and they can be recognized by the host immune system. Antigens are mainly composed of proteins, amino acids, lipids, glycolipids, glycoproteins or nucleic acid markers. These molecules possess the ability to bind to the antibodies (immunoglobulins produced by B cells) produced by the host as an immune response. Antigens are also capable of triggering the host immune system to initiate an immune mechanism. Thus antigens can be both antigenic and immunogenic.

Once the antibodies are present, they bind to the antigen on the foreign entity. Following the specific binding process, they form complexes, and the foreign particles are destroyed via different mechanisms. These mechanisms include agglutination, precipitation or direct killing. Binding of antigen to antibody could also trigger the production of T lymphocytes resulting in the activation of phagocytic mechanisms.

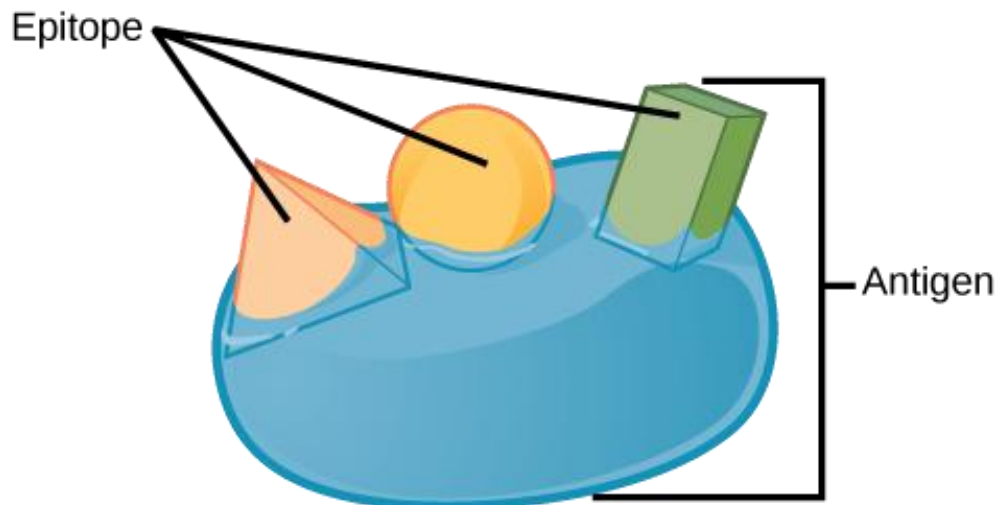


Figure 01: An antigen

Antigens can also be acting as only binding molecules and not act in triggering an immune response. These type of antigens may require a carrier molecule to induce an immune response. These antigens readily cause the production of [antibodies](#) and bind to the antibodies but do not elicit any immune response mechanism. Antigens at present are used in commercial applications such as Enzyme-Linked Immuno Sorbent Assay ([ELISA](#)). These in vitro tests are widely used in molecular diagnostics.

What is an Immunogen?

An Immunogen refers to a specific type of antigen. Immunogen possesses the ability to elicit an immune response upon binding to the antibody. Typically, antigens that are under 20 kDa (~200 amino acids) will not be immunogenic. Therefore they are conjugated to a carrier protein in order to make it immunogenic. Common carrier proteins are [albumin](#), ovalbumin and Keyhole Limpet Hemocyanin (KLH). In addition to overall size, another factor that affects immunogenicity is the concentration of the antigen that is injected. The lower the immunogenicity of the antigen, the more concentrated the inoculation volume needs to be. All immunogens are antigenic.

What are the Similarities Between Antigen and Immunogen?

- Both are present on cellular surfaces of pathogenic microorganisms or foreign entities.
- Both are mainly composed of proteins, lipids, glycoproteins or glycolipids.
- Both act as markers for the host to produce antibodies.
- Both have the ability to bind to antibodies via different chemical linkages.
- Both are antigenic in nature.
- Both can be used under in vitro conditions in molecular diagnostics.

What is the Difference Between Antigen and Immunogen?

Antigen vs Immunogen	
An antigen is a foreign body or a molecule, which has the ability to bind to the antibody but does not necessarily initiate an immune response.	An Immunogen is a foreign molecule or a type of an antigen which can elicit an immune response by triggering the host immune system.
Immunogenic Property	
Immunogenic property is not found in all antigens; only some are immunogenic. Non immunogenic antigens can be made immunogenic by conjugating with a carrier.	All immunogens are immunogenic.

Summary - Antigen vs Immunogen

Antigens and immunogens are more or less similar in nature and differ only in their ability to elicit an immune response. All antigens and immunogens are antigenic and have the ability to bind to antibodies. All antigens are not immunogenic as all antigens are not able to elicit an immune response, whereas all immunogens are immunogenic. Non – immunogenic antigens can be made immunogenic by adhering them to a carrier molecule. This is the difference between antigen and immunogen. Due to these distinct properties, both these molecules play an important role in molecular diagnostics under in vitro conditions.

Reference:

- 1.“Immunogen, Antigen, Hapten, Epitope, and Adjuvant.” *Creative Diagnostics Blog*. Accessed 4 Oct. 2017. [Available here](#)
- 2.“What is an Immunogen?” *ProSciInc*. Accessed 4 Oct. 2017. [Available here](#)

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