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Mini Review

A Particular Kind of Antigen is known as an Immunogen

Arica Suzanne*

National Cancer Institute, NIH, Bethesda, MD, United States

*Corresponding Author's E-mail: suzzannarika@rediff.com

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Abstract

An antigen that can trigger an immunological response is known as an immunogen. The production of antibodies is reliant on a humoral immune response, which is carried out by immune cells that identify a molecule as foreign. When an immunogen is injected alongside an adjuvant, the host's immune system is pushed to mount a particular immunological response, producing antibodies against the immunogen. Antigens less than 20 kDa (200 amino acids) are often not immunogenic. They must be attached to a carrier protein. The concentration of the injected antigen has an impact on immunogenicity in addition to overall size (Carter et al., 2001). The inoculation volume has to be more concentrated the lower the antigen's immunogenicity.

INTRODUCTION

A particular class of antigen is referred to as an immunogen. When an immunogen binds to an antibody, it might trigger an immunological response. Antigens less than 20 kDa (about 200 amino acids) are often not immunogenic. They need to be exposed to a peptide chain that T cells can recognise and recognise, triggering an immunological response. Antigenic immunogens are ubiquitous. Inside the human body, poison is recognised as a foreign chemical. It is very antigenic. However, due to its size, T cells are unable to recognise it, which prevents the production of antigens to protect against the toxin (Davis et al., 1984). As a result, it is not immunogenic and does not trigger an immunological response. It becomes immunogenic by attaching to a peptide chain (known as the happen service effect), which T cells detect and use as the basis for an immunological response to poison ivy. An immunogen is something that might trigger the immune system's reaction. It can then respond using the outcomes of the immunological response (including antibodies). Any substance that may attach to antibodies is referred to as an antigen (antibody mill). Antibodies are (in humans in addition to) Y-shaped molecules that help to enable the elimination of foreign and typically harmful organisms or substances, including toxins and poisons, through phagocytosis or exocytosis (imagine swallowing or spitting). An immunological response to antigens may or may not be triggered. Self-antigens, such as those found on your blood type's purple blood cells, often do not cause an immune response. Something that can react with the byproducts of an immune response is known as an antigen. It either can or cannot trigger an immunological response. This implies that while all antigens are also antigens, not all antigens are also immunogens. While all antigens are immunogens, not all immunogens are antigens (Crick 1958). This is due to the fact that some antigens are too tiny or challenging for the immune system to recognise, which prevents macrophages from capturing the antigen and activating B-cells. There won't be any humoral response if B-cells aren't activated to create particular antibodies that detect the foreign antigen. The antigen is not an immunogen if this is the case. Contrarily, immunogenic antigens can trigger a humoral immune response and cause the production of antibodies in response, which results in the formation of antibodies (Haselkorn et al., 1973).

Normal cellular proteins or a combination of proteins known as autoantigens or self-antigens are wrongly targeted by the immune system and cause autoimmune disorders. Because of reduced immunological tolerance brought on by genetic or environmental causes, a normal self-protein turns into a self-antigen (Moldave 1985).

Tumor-specific mutations that arise during the neoplastic transition of healthy cells into malignant cells result in the production of tumour antigens. These antigens are expressed on the surface of cancer cells so that the immune system can detect them. Although most cancer cells display cell surface antigens, they develop the capacity to avoid the immune system's removal.

Any of the countless antigens (substances that might elicit an immunological response) that are a part of the major histocompatibility complex (MHC) in humans is known as a human leukocyte antigen (HLA). The MHC's cell-surface proteins are encoded by the HLA genes (Lucas et al., 1971).

A highly variable gene complex with more than 200 genes, all of which are found on chromosome 6, is responsible for programming HLA antigens. Three separate classifications of HLA genes exist: class I, class II, and class III. The immune system's capacity to protect against a variety of antigens is significantly aided by the potential of multiple variants in these genes.

Any of the countless antigens (substances that might elicit an immunological response) that are a part of the major histocompatibility complex (MHC) in humans is known as a human leukocyte antigen (HLA). The MHC's cell-surface proteins are encoded by the HLA genes (Lengyel et al., 1969).

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The HLA system is helpful in tissue typing, which is the process of analysing tissues from one person to see if they may be effectively transplanted into another person. Human illnesses including several autoimmune conditions and cancer are linked to a number of HLA genes (Weissbach 2012).

An antigen is any foreign substance that selectively attaches to a lymphocyte-made receptor molecule, often one of a complex nature and frequently a protein. Antigens are molecules on the surface of foreign objects like pollen, dust, or transplanted tissue as well as molecules on the surface of invasive microbes including viruses, bacteria, protozoans, and fungi. A reaction from the immune system may or may not be triggered when an antigen attaches to a receptor molecule. Immunogens are antigens that cause such a reaction. Therefore, it may be claimed that while all antigens are antigens, not all immunogens are antigens. Therefore, it may be claimed that while all antigens are antigens, not all immunogens are antigens. As an illustration, a hapten is a straightforward chemical group that may interact with a lymphocyte receptor (i.e., is an antigen) but does not trigger an immune response (i.e., is not an immunogen). A protein, for example, can make haptens immunogenic, a property that is valuable in the study of immune responses even if haptens cannot elicit an immune response on their own (Loftfield et al., 1972). On various parts of their surfaces, many antigens display a range of diverse three-dimensional patterns. Each pattern is referred to as an antigenic determinant, or epitope, and each epitope has the potential to interact with a distinct lymphocyte receptor. Complex antigens have a "antigenic mosaic" and can cause a range of distinct lymphocytes to react. Because there are more sensitive cells present, some antigenic determinants are better at inducing an immunological response than others. There is a chance that two or more dissimilar compounds might share an epitope. In these circumstances, all antigens having the same epitope might elicit a response from immunological components initiated by a single antigen. Cross-reacting antigens are these kinds of antigens. Which antigens T cells and B cells can detect depends on the type of the antigen that each recognises (Andersen et al., 2003). T cells only identify intruders that have somehow made their way inside the body's cells, whereas B cells attach to the antigen on invaders that are present in circulation outside the body's cells. Therefore, foreign substances that have been absorbed by bodily cells or microbes like viruses that enter cells and proliferate there are outside the range of antibodies but can be destroyed by T cells.

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