

# Strategies of Immunology against Pathogens

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## Description

Immunopathology is a branch of medicine that deals with immune responses associated with disease. It includes the study on how the immune system, immunity and immunological responses relate to the pathology of an organism, organ system or illness. It is a term used in biology to describe damage caused to an organism as a result of an infection by the organism's own immune response. It frequently happens when an animal pathogen infects a human and may be caused by a mismatch between the infection and the host species (e.g. avian flu leads to a cytokine storm which contributes to the increased mortality rate).

There is either an antigen specific or nonspecific reaction to a foreign antigen when it enters the body. Whether the foreign antigens are lethal or not, the immune system is defending itself with these reactions. Immunopathology may relate to the way that exogenous antigens trigger an immunological response from the body or to issues that may develop as a result of an organism's own immune reaction to itself. The immune system can have some issues or flaws that can result in more severe illness or disease. One of the issues listed below may be the cause of these illnesses. The first would be hypersensitivity reactions, in which the immune system would react more strongly than usual. There are four distinct types (types 1, 2, 3 and 4), each of which has a unique type and level of an immune response. Each variety can cause issues ranging from minor allergic reactions to more serious conditions like TB or arthritis. Autoimmunity, where the immune system attacks itself rather than the antigen is the second type of immune system problem. Due to the self-reactive nature of the immune cells involved, inflammation is a prime example of autoimmunity. Type 1 diabetes, Addison's disease, and celiac disease are a few instances of autoimmune illnesses. The third and final immune system issue is immunodeficiency, which occurs when the immune system is unable to combat a particular illness. The immune system's capacity to fight it is either compromised or non-existent. Primary immunodeficiency, in which an essential component of the immune system is either missing or the immune system, does not function properly and secondary immunodeficiency, in which the

disease is acquired from an external source, such as radiation or heat and the immune system, is subsequently unable to function properly. Immune deficiencies can be brought on by illnesses including HIV, AIDS and leukaemia.

Innate immunity and adaptive immunity are the two types of immunological responses seen in all vertebrates. Innate immunity is regarded as nonspecific because it protects against antigens that don't change. It's a good idea to have a backup plan in place in case the backup plan is lost or damaged. It is made up of physical barriers like the skin as well as a variety of generalized immune cells such dendritic cells, macrophages and basophils. Adaptive immunity is the second type of immunity. Before a reaction can be created, this type of immunity necessitates the recognition of the foreign antigen. Once the antigen has been detected, a particular reaction is created to kill that particular antigen. This concept leads to the notion that specific immunity includes adaptive immunity. The ability to use memory to fight the antigen in the future is a crucial aspect of adaptive immunity that sets it apart from innate immunity. The organism must produce antigen receptors from the first time the antigen is present because it lacks them when the antigen is first introduced. The immune system then creates a memory of that antigen, enabling it to detect it more quickly in the future and respond to it more quickly and effectively. The more antigen exposure the system receives, the faster it will develop response.

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