

## Immune System Disorders and Causes of Immunological Diseases

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### DESCRIPTION

The immune system is made up of various cell and organ types that defend our bodies from infections. Microorganisms including bacteria, fungi, viruses, and protozoans that cause illnesses in the body are referred to as pathogens. Antigens are substances that cause the production of antibodies. They can include any organism that does not naturally exist in human bodies, including parasites, fungi, bacteria, viruses, and haptens. Haptens are compounds that, when paired with a carrier molecule, can elicit an immunological response. All of the immune system's molecules and cells are spread throughout the body's tissues and lymphoid organs, where they fight off infectious diseases caused by microbes, decrease the growth of tumors, and begin the process of healing damaged tissues.

The immune system's tissues and organs serve as security forces, with molecules serving as weapons, where cells act as the security guards and use the communication system to protect us. Humans have two different immune systems, and they are categorized according to whether or not they were present at birth.

### Innate immune system

The immune system fights against microbes and stops them from entering the body. The innate immune system is made up of cells and proteins that are constantly present and prepared to battle pathogens in an infected area. Our innate immune system is active from the time of our birth.

The innate immune system's primary components include:

- Dendritic cells
- Phagocytic leukocytes
- Natural Killer (NK) cell
- Physical epithelial barriers
- Circulating plasma proteins

### Adaptive immune system

Pathogens that are resistant to innate immune defenses must be combated by the adaptive immune system. Because it develops over the course of a lifetime, it is also known as the acquired immune system. They are particular to the kind of infection that

has invaded the body. All of the adaptive immune system's components are normally dormant, but when activated, they adapt to the presence of all infectious organisms by multiplying and creating a powerful mechanism for killing the bacteria.

Both humoral immunity, which is regulated by antibodies produced by B lymphocytes, and cell-mediated immunity, which is regulated by T lymphocytes, are examples of adaptive responses. Immune system flaws are the root cause of immunological disorders. The immune system may become overactive, releasing chemicals and antibodies. As a result, allergies and anaphylaxis occur. Autoimmune disorders can develop when the immune system fails to differentiate self-cells from non-self cells. The immune system is put to the test in this circumstance, leading to reactions that harm cells and tissues instead of defending them. Malnutrition, immunological deficiencies, gene abnormalities, and viruses like HIV are the causes of all immunodeficiency illnesses, which raise the risk of tumors and infections.

### CONCLUSION

The first immunological, general defense against pathogens is called innate immunity. The complement system, phagocytes, T cells, mast cells, basophils, and eosinophils all play a role in the quick immunological response that happens minutes or hours after aggression. In order to combat infectious organisms, innate immunity and adaptive immunity co-evolve. Adaptive immunity depends on the carefully controlled interactions of T cells, APCs, and B cells. The development of immunologic memory, or the capacity of the system to learn from or store its experiences with different pathogens, is a crucial aspect of adaptive immunity. This memory enables the body to mount efficient and quick immune reactions in response to future exposure to the same or similar pathogens.

The adaptive immune system and its innate counterpart work very well together, and abnormalities in either system can result in immunopathological disorders such as autoimmune diseases, immunodeficiencies, and hypersensitivity reactions. This supplement's next chapters will concentrate on the proper diagnosis, care, and management of some of these more noticeable illnesses, especially those connected to hypersensitive reactions.

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