



An Overview of Innate and Adaptive Cells Role in Immune system

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DESCRIPTION

The immune system is a complex network of cells, tissues, and organs that work together to defend the body against harmful invaders like bacteria, viruses, and cancer cells. The immune system is composed of two main types of cells: The innate immune cells and the adaptive immune cells. The innate immune cells are the first line of defense against invading pathogens, while the adaptive immune cells provide a more specific response to a particular pathogen.

Innate immune cells include Neutrophils, Macrophages, Mast cells and Dendritic cells, etc. Neutrophils are a type of white blood cell that plays a crucial role in the immune system's defense against infections. They are the most abundant type of white blood cell and are essential for the innate immune response, which is the body's first line of defense against foreign invaders such as bacteria and viruses. Neutrophils work by engulfing and destroying invading pathogens, a process called phagocytosis. They also release enzymes and other substances that can kill the pathogens directly or recruit other immune cells to the site of infection. They can produce cytokines, which are signaling molecules that can activate other immune cells and help coordinate the immune response and also involved in the process of inflammation, which is a key part of the immune response. When a tissue is infected or damaged, neutrophils are among the first cells to migrate to the site of injury, where they release substances that cause blood vessels to dilate and become more permeable. This allows other immune cells and fluids to enter the tissue and begin the process of repair and healing. Macrophages are large phagocytic cells that play an important role in

innate immunity. They engulf and digest invading pathogens and also produce cytokines, which are signaling molecules that help recruit other immune cells to the site of infection. Dendritic cells are specialized cells that present antigens, which are pieces of invading pathogens, to T cells to activate an adaptive immune response. Natural killer cells are a type of lymphocyte that can kill infected cells and cancer cells. They do not require prior exposure to a specific pathogen, making them part of the innate immune system. Mast cells are involved in the body's response to allergies and parasitic infections. They release histamine and other inflammatory molecules in response to an allergen or parasite.

An adaptive immune cell includes T cells, B cells, Plasma cells, Memory cells. T cells are lymphocytes that play a critical role in adaptive immunity. There are two main types of T cells: helper T cells and cytotoxic T cells. Helper T cells help activate other immune cells, while cytotoxic T cells directly kill infected cells. B cells are also lymphocytes that produce antibodies, which are proteins that can recognize and bind to specific antigens. The antibodies can then help to neutralize or destroy the invading pathogen. Plasma cells are a type of B cell that produces large amounts of antibodies. Memory cells are a type of T or B cell that remembers a previous encounter with a specific pathogen. If the pathogen is encountered again, the memory cells can quickly mount a specific immune response to eliminate the invader. The different types of immune cells each have their own unique functions and work together to coordinate an effective immune response. By understanding the different cells involved in the immune system and their functions, we can better understand how the immune system works to keep us healthy.

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