

EXPLORING LEUKOCYTE DIVERSITY IN INNATE IMMUNE DEFENSE

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This summary aims to describe, explore and highlight the importance and diversity of leukocytes present in the innate immune response. Innate immunity is so named because it is present from birth and is the body's first line of defense against invading pathogens, playing a critical role in immediate protection against infections. However, its components treat all foreign invaders in an essentially uniform manner, also have little specificity, and do not perform somatic recombination in contrast to acquired immunity. Leukocytes, also known as white blood cells, are the main effectors of innate immunity. This abstract explores the major types of leukocytes involved in innate immunity, including neutrophils, monocytes, macrophages, dendritic cells, natural killer (NK) cells, eosinophils, basophils, complement system, mast cells, and cytokines, examining their specific functions and interactions in the immune system. Neutrophils, the most frequent white blood cells in the bloodstream, are one of the pioneers in the immune response against infections. They act as phagocytes, encompassing bacteria and other invading cells. In addition, neutrophils contain containers that release enzymes capable of eliminating and breaking down these invading cells. Macrophages are monocytes that have migrated from the bloodstream to tissues, and their main function is to phagocytize microorganisms. After migration, it increases in size and produces granules inside, full of enzymes and digestive substances, which help in the destruction of phagocytosed bacteria. After phagocytosis, it releases cytokines, substances that attract other white blood cells to the site of infection. Dendritic cells, which specialize in capturing and presenting antigens to lymphocytes, are seen as a connection between innate and adaptive immunity, as they are attracted to and activated by elements of the innate response and facilitate the activation of lymphocytes in the adaptive immune response. Natural killer cells get their name because they are ready to eliminate as soon as they are formed. They identify and adhere to infected or cancerous cells, and then release enzymes and other substances that cause damage to the outer membranes of those cells. Natural killer cells play a crucial role in the initial response against viral infections. Eosinophils have the ability to phagocytize bacteria, but they also direct their activity to foreign cells that are too large to be ingested. They contain granules that release enzymes and other toxic substances when they come across foreign cells. Basophils do not ingest foreign cells. They contain histamine-filled granules that are released when they encounter allergens (antigens that cause allergic reactions). Mast cells are found in tissues and perform a function similar to that of basophils in the blood. When exposed to an allergen, they release histamine and other substances that trigger inflammatory and allergic responses. It is imperative to understand the different types of leukocytes and their specific functions, as it is critical to understanding the complexity and effectiveness of the innate immune system.

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