Innate Immunity Cellular Response

The innate immune system also has cells that generally respond to all pathogens and foreign substances. Natural killer lymphocytes, or NK cells, are cytotoxic cells that rapidly respond to and destroy viral cells and tumors. They act about three days after infection. Neutrophils in the blood plasma are phagocytes and will engulf pathogens and infected cells. Interferon is a protein made and released by host cells in response to the presence of viruses, bacteria, parasites, or tumors. The immune system also has a complement system, which helps antibodies and phagocytic cells clear pathogens from the body by lysing pathogens and infected cells. Dendritic cells process antigen information and present it on the cell surface for the adaptive immune response. Finally, macrophages exist in tissues and phagocytize infected cells and pathogens.

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Characteristics

Natural Killer Lymphocytes Attack Abnormal Cells

NK Lime-assassin Executioner Attacking Sick Cell

Natural killer lymphocytes, or NK cells, rapidly respond to virally infected cells and tumor formation, typically within three days. They cause lysis or apoptosis by detecting the MHC on a problem cell and releasing cytokines.

Neutrophils in Blood

Nude-trojan in Blood

Neutrophils are phagocytic molecules that circulate in blood. They ingest pathogens and are called to infected sites through chemical signaling. They move via chemotaxis, following the concentration gradient of cytokines. Neutrophils are the predominant cells in pus and account for its white/yellow appearance.

Infected Cells Release Interferon

Sick Cell shooting Infinity-flare-gun

Host cells make the protein interferon in response to infection by viruses, bacteria, parasites, or the emergence of a tumor cell. Interferons are cytokines that start the signaling cascade of the immune response.

Complement Proteins Lyse Pathogens/Infected Cells

Complementing Protein Popping Pathogen

The complement system is part of the innate immune system and complements the abilities of antibodies or phagocytic cells to remove pathogens. Complement proteins lyse open infected cells or pathogens and kill them. The debris is usually processed by phagocytic molecules.

Dendritic Cells in Tissue

Dreadlocks Cell on Tissue-box

Dendritic cells are antigen-presenting cells. They present an antigen on the cell surface so that the adaptive immune system can generate the appropriate specific response to the pathogen that the antigen came from.

Macrophages in Tissue

Macaroni-mac-man on Tissue-box

Macrophages exist in the interstitium of tissue. They are phagocytes, engulfing and digesting intercellular debris and pathogens. They also signal other parts of the immune system through cytokines.