Inflammatory Response

The body uses inflammation as part of the immune response against foreign particles. It begins when pathogens infect various tissues of the body. At the tissue level are mast cells, which release histamine to dilate capillaries and increase their permeability to molecules. This allows macrophages to leave the capillaries and blood stream. They enter the tissue, where foreign particles are, and engulf the pathogens through phagocytic activity. They also signal more immune cells with cytokines, while neutrophils respond by crossing the capillary wall. Neutrophils are also a type of phagocyte, and engulf pathogens. Finally, B and T cells arrive from the cytokine signaling as part of the adaptive immune response.

PLAY PICMONIC

Pathogens Infect Tissue

Pathogens lighting Tissue-box on Fire

Inflammation occurs when pathogens infects various tissues in the body, inciting an immune response.

Mast Cells Release Histamine

History-man falling off damaged Mast

Mast cells are resident cells in many types of tissues and are rich in histamine and heparin. They release histamine rapidly into the interstitium, which triggers an immune response.

Histamine Dilates and Increases Capillary Permeability

History-man opening Dyed Caterpillar's mouth

Histamine acts on the capillaries near the infected tissue by dilating them to allow for more blood flow and increasing their permeability to immune cells.

Macrophages Engulf Pathogens

Macaroni-mac-man eating Pathogens

Macrophages can travel through the more permeable capillary wall to the interstitium and engulf any pathogens through phagocytic activity.

Macrophage Signals Cells With Cytokines

Macaroni-mac-man signaling for help with Side-toe-kite

Macrophages also signal other immune cells by releasing cytokines. Cytokines help initiate a cascade of intracellular signaling. There are numerous cytokines, and these are responsible for different inflammatory and immune responses in the body by signaling to various immune cells.

Responding Neutrophils Cross Capillary Wall

Nude-trojans squeezing through Caterpillar

Neutrophils respond to the cytokine stimulus and also extravasate through the capillary wall into the interstitium. Neutrophils are also phagocytes i.e. they consume and destroy pathogens intracellularly.

B And T Lymphocytes Arrive At Injury Site

Basketball and Tennis-ball Lime-assassins arriving behind the Nude-trojans

The last part of the immune response is the adaptive immune response. B- and T-cells from the humoral and cell-mediated responses arrive later at the site of tissue injury/inflammation to produce antibodies (B-cells), destroy infected cells (killer T-cells), and create memory cells (B-cells) in case of future reinfection.