

Name _____

The Fire Within: Understanding Inflammation

Open-Ended Response Answer Key

1. During inflammation, blood vessels dilate to increase blood flow to the site of injury or infection, allowing immune cells to reach the affected area more quickly. Blood vessels also become more permeable, allowing immune cells and other beneficial substances to move from the bloodstream into the tissues. Immune cells release cytokines, which act as messengers to recruit more immune cells and promote the inflammatory response. These cytokines also stimulate the production of inflammatory mediators, such as prostaglandins and histamines, which contribute to the characteristic symptoms of inflammation, such as redness, swelling, and pain. Ultimately, inflammation helps isolate and contain the infection, promotes tissue repair, and enhances the activity of immune cells to clear the infection.
2. Inflammation plays a crucial role in promoting tissue repair and healing following injury. By increasing blood flow to the affected area and recruiting immune cells, inflammation helps remove damaged cells and debris, initiate the formation of new blood vessels, and stimulate the production of connective tissue. This process creates a favorable environment for tissue repair and regeneration, ultimately restoring the affected tissue to its normal structure and function.
3. Chronic inflammation can be harmful to the body because it can lead to tissue damage, organ dysfunction, and the development of chronic diseases. Persistent activation of the immune system can cause prolonged inflammation, which may damage healthy tissues and organs over time. Chronic inflammation has been linked to a variety of health conditions, including cardiovascular disease, diabetes, autoimmune disorders, and certain cancers. For example, rheumatoid arthritis is an autoimmune disease characterized by chronic inflammation of the joints, leading to pain, stiffness, and joint damage.
4. Anti-inflammatory medications work by reducing inflammation and alleviating the symptoms associated with inflammatory conditions. These medications may inhibit the production of inflammatory mediators, block the action of pro-inflammatory molecules, or suppress the activity of immune cells involved in the inflammatory response. Anti-inflammatory medications are commonly prescribed to individuals with conditions involving inflammation, such as arthritis, asthma, and inflammatory bowel disease, to help manage symptoms and prevent disease progression.

