Research & Reviews: Journal of Medical and Health Sciences ISSN: 2319-9865

Explanation of Surface Barrier and Innate Immune System

Habtamu Fekadu Gemede*

Department of Food Technology and Nutrition, Wollega University, Nekemte, Ethiopia

Commentary

Received: 05-May-2023, Manuscript No. JMAHS-23-97989; **Editor assigned:** 09-May-2023, Pre QC No. JMAHS-23-97989 (PQ); **Reviewed:** 23-May-2023, QC No. JMAHS-23-97989; **Revised:** 30-May-2023, Manuscript No. JMAHS-23-97989 (R); **Published:** 06-Jun-2023, DOI: 10.4172/2319-9865.12.2.009.

***For Correspondence:** Habtamu Fekadu Gemede, Department of Food Technology and Nutrition, Wollega University, Nekemte, Ethiopia

E-mail: mebrtdufra@gmail.com

Citation: Gemede HF, Explanation of Surface Barrier and Innate Immune System. RRJ Med Health Sci. 2023;12:009.

ABOUT THE STUDY

An organism is protected from diseases by its immune system, which is a network of biological functions. The organisms own healthy tissue is distinguished from a variety of pathogens, including viruses, parasitic worms, cancer cells, and external objects like wood splinters. There are two main immune system subsystems in many species. The way the innate immune system responds to various circumstances and stimuli is predetermined. The adaptive immune system recognises chemicals it has come into contact with before and creates a response specific to each stimulus. Both rely on molecules and cells to carry out their distinct roles.

A form of immune system is present in almost all living things. The foundational immune system of bacteria is made up of enzymes that protect against viral infections. The descendants of prehistoric plants and animals still possess additional fundamental immune systems that they created. Phagocytosis and other antimicrobial peptide defence mechanisms are some of these mechanisms. Adaptive immunity, which is often referred to as acquired immunity, develops an immunological memory that strengthens the body's defences against the same disease in the future. The foundation for vaccination is this process of immunity development.

Immune system malfunction can lead to autoimmune diseases, cancer, and inflammatory diseases. Low immune system activity, which causes frequent and possibly fatal infections, is a hallmark of immunodeficiency. People can develop immunodeficiency due to hereditary conditions like severe combined immunodeficiency, acquired diseases like HIV/AIDS, or even drug use that suppresses the immune system. Autoimmune disease is brought on by an overactive immune system that targets healthy tissues as foreign entities. Examples of widespread autoimmune diseases include systemic lupus erythematosus, rheumatoid arthritis, Hashimoto's thyroiditis, and type 1 diabetes.

Surface barriers

Infection-preventing mechanisms include mechanical, chemical, and biological barriers. Examples of mechanical barriers that serve as the first line of defence against infection include the waxy cuticle of the majority of leaves, the

exoskeleton of insects, the shells and membranes of externally laid eggs, and skin. Because organisms cannot totally isolate themselves from their surroundings, mechanisms work to safeguard body openings such the genitourinary tract, lungs, and intestines. Pathogens and other irritants from the respiratory tract are mechanically ejected from the lungs by coughing and sneezing. While mucus released by the respiratory and gastrointestinal tracts serves to catch and entangle bacteria, tears and urine also mechanically wash out infections.

Commensal flora compete with pathogenic bacteria for nutrients and space in the genitourinary and gastrointestinal tracts, and in some situations, they alter their environment by adjusting factors like pH or the amount of iron that is accessible. These actions operate as biological barriers. As a result, there is a lower chance that germs will accumulate to a level where they can spread illness.

Innate immune system

The innate immune system's cells and mechanisms come into contact with microbes or toxins that effectively penetrate an organism. Typically, the innate response is set off when pathogens are recognised by pattern recognition receptors, which look for characteristics that are shared by large groups of microbes, or when stressed, injured, or damaged cells send out alarm signals, many of which are recognised by the same receptors as those that look for pathogens. The non-specific nature of innate immune defences means that they react to infections in a general way. This method does not provide enduring immunity to a virus. In most organisms, and only in plants, the innate immune system predominates as the host defence mechanism.

Immune sensing

Innate immune system cells identify pathogen-produced molecular structures *via* pattern recognition receptors. They are primarily innate immune system cells such dendritic cells, macrophages, monocytes, neutrophils, and epithelial cells that express these proteins. To recognise two groups of molecules: Damage-Associated Molecular Patterns (DAMPs), which are linked to host cell components released during cell damage or cell death, and Pathogen-Associated Molecular Patterns (PAMPs), which are linked to microbial pathogens.

Innate immune cells

Leukocytes, or white blood cells, are the second branch of the innate immune system and exhibit certain characteristics of independent, single-celled organisms. The "professional" phagocytes (macrophages, neutrophils, and dendritic cells) are a subset of innate leukocytes. These cells locate and destroy pathogens, either by directly contacting and killing larger pathogens or by engulfing and destroying smaller organisms. Mast cells, eosinophils, basophils, innate lymphoid cells, and natural killer cells are some of the additional cells involved in the innate response.

Inflammation

One of the immune system's initial reactions to an infection is inflammation. Redness, swelling, heat, and discomfort are signs of inflammation and are brought on by an increase in blood flow to the affected tissue. Eicosanoids include prostaglandins, which cause inflammation-related blood vessel dilatation and fever, and leukotrienes, which draw certain leukocytes (white blood cells).