

Biology 2nd paper
Chapter-10
Lecture-02[EV]

In this lecture we will learn : First line of Defence System , Second line of Defence System ,Third line of Defence System.

First line of Defence System:The first line of defence system are the physical and chemical barriers,which are considered functions of innate immunity.Pathogenic microorganisms must make it first line of defence. The first line of defence includes-

1.Skin: Skin acts as the main physical barrier for the foreign particles and microorganisms.The acidic pH of the skin and the oil and sweat secreted from the glands of skin are harmful for the bacteria. The symbiotic microorganisms present in skin prevent the infections by other microorganisms.

2.Hair: Hair within the nose filters microbes, dust, and pollutants from the air to prevent them from invading the body.

3.Cilia: Cilia and mucus in respiratory tract continually remove dust and microbes by trapping and swallowing. Germs stick to mucus and cilia remove the mucus.

4.Cerumen: The cerumen also known as earwax,is a brown, grey, or yellowish waxy substance secreted in the ear canal of human.

5.Tears, mucus and saliva:Tears, mucus,saliva contain lysozyme enzyme, phospholipase A histalins that breaks down the cell wall of many bacteria.those that are not killed immediately are trapped in mucus and swallowed. The inner lining of our nose ,throat, gut. Lungs also produces mucus to trap invading pathogens.

6.Stomach acid and enzymes: The stomach is a formidable obstacle in so far as its mucosa secrete hydrochloric acid and protein- digesting enzymes kill many pathogens.

7.Urinogenital acid: The symbiotic bacteria present in vegina produce lactic acid which kill other pathogenic infection.Fast flowing urine flushes microbes out of the urethera.

8.Microbiome:In various regions of the body ,the resident microbiota provide a physical defence by occupying available cellular binding sites and competing with pathogens for available nutrients.

9.Defecation and vomiting:The body expels microorganisms via bowel movement and vomit.

Second line of Defence System : the second line of defence is nonspecific resistance, which also considered a function of innate immunity. The second line of defence includes-

1.Phagocytes{ WBC}

2.Natural killer cells[NK cells]

3.The complement system

4.Cytokines

5.Interferon

6.Acute phase proteins [APPs]

7. Inflammation

8. Fever

9. Blood clotting

Third line of Defence System:The last line of defense against pathogens called the third level of immunity . Scientists A. C.Gyton and J.E.Hall classified this level into two groups. They are-

1. Innate immunity

2. Acquired immunity