

## INNATE IMMUNITY

**1.What is innate immune response? Discuss in brief, different types of innate immune mechanisms you have studied.**

The innate immune response (non-specific immune system or in-born immunity system) is the first line of host defense against invading pathogens until an acquired immune response develops. This immune response does not provide long-lasting immunity to the host.

**Types:**

**A.Anatomic Barrier, B. Physiologic Barrier, C.Endocytic Barrier and 4.Inflammatory Barrier.**

**A.Anatomic Barrier:**This barrier tend to prevent the entry of pathogens as first line defense. It may be categorized as follows—

a)Skin (Consists of two distinct layer- epidermis and dermis)—Sebum released from sebaceous gland which are associated with the hair follicle.

Function:Sebum consists of lactic acid and fatty acids, maintaining the pH of the skin between 3 and 5 and act inhibitory role to the growth of most microorganisms.

b)Mucus—The conjunctivae and the alimentary, respiratory and urogenital tracts are lined by mucous membranes. The viscous fluid mucus is secreted by epithelial cells of mucous membranes.

**Function:** i)It entraps foreign microorganisms;

ii)In the lower respiratory tract and the gastrointestinal tract, the mucous membrane is covered by cilia.The synchronous movement of cilia propel mucous entrapped microorganisms from these tracts.

iii)Mucous on the epithelial cells outcompete for attachment sites of nonpathogenic organisms and thus inhibits colony formation.

**B. Physiologic Barrier:**

These barriers include—

a)Temperature:

Chickens display innate immunity to anthrax because their high body temperature inhibits the growth of this pathogen.

b)pH:Gastric acidity provides an innate physiological barrier to infection.

c)Oxygen tension

d)Various soluble factors: A variety of soluble factors contribute to nonspecific immunity. e.g;

1.Lysozyme, 2.Interferon, 3.Complement.

1.Lysozyme—A hydrolytic enzyme found in mucous secretions, is able to cleave the peptidoglycan layer of the bacterial cell wall.

2.Interferon—Comprises a group of proteins produced by various infected cells. Among the many infections of the interferons is the ability to bind to nearby cells and induce a generalized antiviral state. Selected functions of some interferons are given in the tabular form below—

Name	Secreted by	Target cells/ Tissue	Action
Interferon alpha (IFN- $\alpha$ )	Leukocytes	Uninfected cells	Inhibits viral replication
IFN- $\beta$	Fibroblasts	Uninfected cells	Inhibits viral replication
IFN- $\gamma$	$T_H^1$ , $T_C$ , NK cells	Macrophages	Inhibits viral replication and enhances activity

3.Complement—

This is a group of serum proteins that circulate in an inactive proenzyme state. These proteins can be activated by a variety of specific and nonspecific immunologic mechanisms. That converts the inactive proenzyme into active