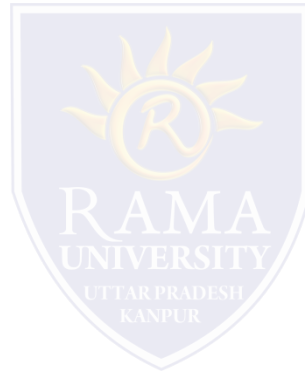




## FACULTY OF MEDICAL SCIENCES

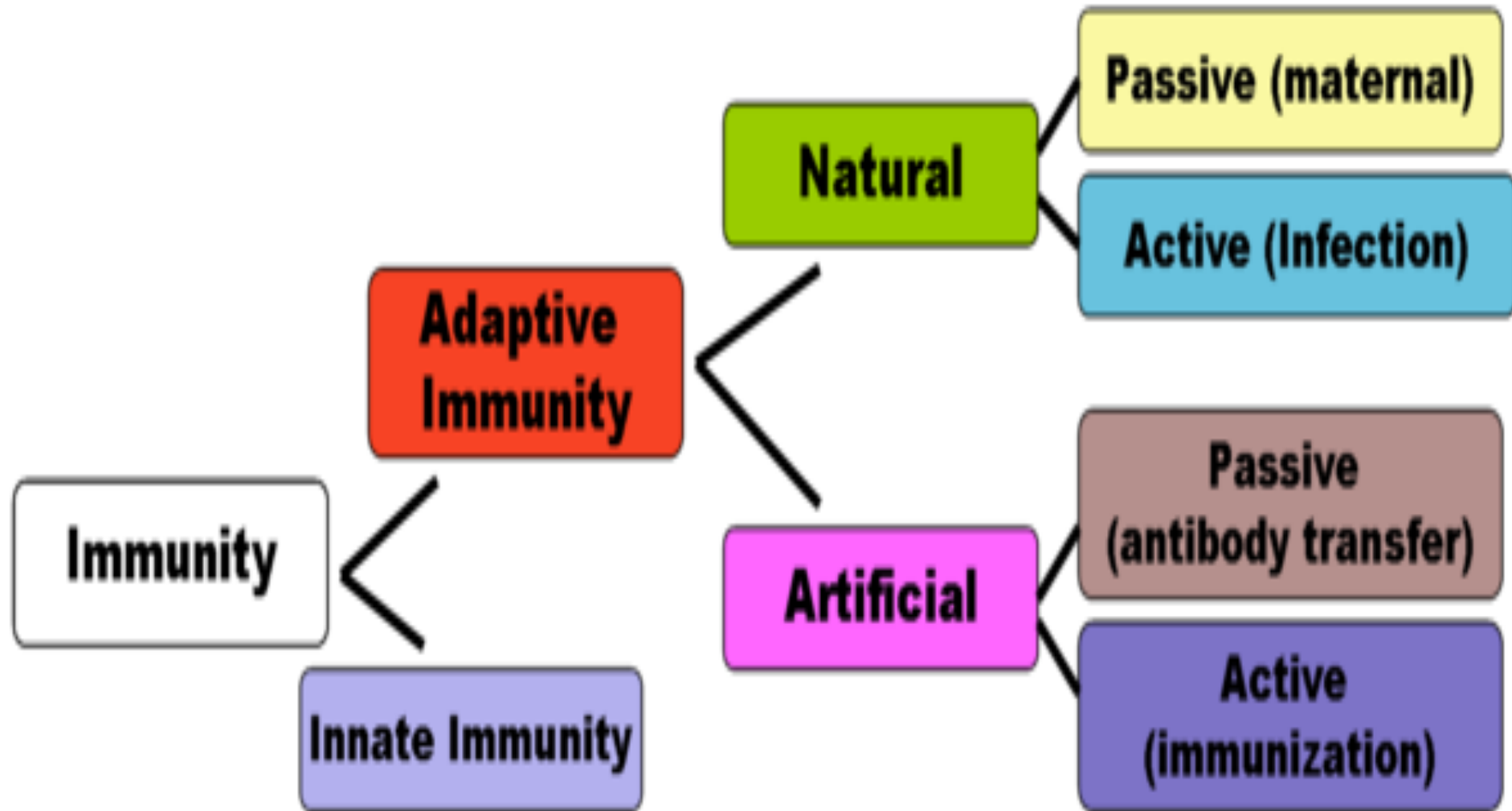
Submitted by-  
Mrs. Akshita Tiwari  
Assistant Professor,  
Department of Biotechnology.

**Unit – I**  
**Topic- Types of Immunity.**



# Introduction

- Immunity is the ability of the body to protect against all types of foreign bodies like bacteria, virus, toxic substances etc. which enter the body.
- As it protects us from disease it is also called **disease resistance**.
- Lack of immunity is known as susceptibility.
- Immunity is done by immune system which is a complex network of lymphoid organs such as **bone marrow, thymus, spleen etc.**
- The physiologic function of the immune system is to conform protection against infectious microbes and non-infectious macromolecules.



## Innate Immunity

- It is also called natural or native immunity, consist of mechanisms that exist before infection and are capable of rapid responses to microbes.

- It is comprises four types of defense barriers-

- 1) Anatomical barriers
- 2) Phagocytic barriers
- 3) Blood proteins and
- 4) Cytokines.

- This is also known as Non-specific or Non-adaptive immunity. Innate immunity is the first line of defense against infectious organisms and do not depend on previous exposure i.e. the immunity existed before encountering the microbes.



## Type

## Mechanism

### 1) Anatomical barriers

#### a) Skin

- Mechanical barriers retards entry of microbes.
- Acidic environment (pH 3-5) retards growth of microbes.

#### b) Mucous membrane

- Mucous entraps foreign microorganism.

### 2) Physiologic barriers

#### a) Temperature

- Body temperature and fever response inhibits growth of some pathogens.

#### b) Low pH

- Acidic pH of stomach (pH 2) kills most ingested microorganism.

### 3) Phagocytic barriers (Neutrophils, Macrophages and NK cells)

- Ingest and destroys microbes by endocytosis and phagocytosis)

### 4) Inflammatory barriers

- Tissue damage and infection induce leakage of vascular fluid, containing serum protein with antibacterial activity.

## Types of innate immunity

It is of three types-

- 1) Species Immunity
- 2) Racial Immunity
- 3) Individual Immunity

### **Species immunity:**

It is the total immunity shown by all members of a species against pathogen; e.g. birds immune to tetanus.

### **Racial immunity:**

It is that in which various races show marked difference in their resistance to certain infectious disease.

### **Individual immunity :**

This is very specific for each and every individual despite having same racial background and opportunity for exposure.



# Acquired immunity

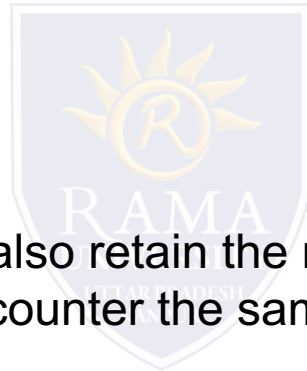
▪ **Acquired or adaptive immunity** is the immunity that is developed by the host in its body after exposure to suitable antigen or after transfer of antibodies or lymphocyte from an immune donor.

## Characteristics of Acquired Immunity:

1. Antigenic Specificity
2. Diversity
3. Immunologic memory
4. Self/non-self recognition

▪ The acquired immune response also retain the memory of previous exposure to the antigen so that next time it encounter the same antigen more stronger will be response.

▪ The acquired immune response takes several days to the develop that is it develops rather slowly but once develops the immune response is incredibly effective.





# Types of Acquired Immunity

Acquired Immunity is of two types-

- 1) Active immunity.
- 2) Passive immunity.

## 1. Active immunity:-

It is induced by natural exposure to a pathogen or by vaccination.

It can be categorized into two types-

- Naturally acquired.
- Artificially acquired active immunity.

## 2. Passive immunity:-

Passive immunity is achieved by transfer of immune products, such as antibody or sensitized T-cells, from an immune individual to non immune one.

It is of two types-

- Naturally acquired.
- Artificially acquired passive immunity.



## Mechanism of adaptive immunity

Body's immune system provide protection by synthesizing antibodies or immunoglobulin in response to an antigen.

- **Primary immune** response takes place when the host is attacked by certain microbes for first time. The antibodies start to generate after certain period as the binding of an antigen with its particular antibody is very specific.
- **Secondary immune** response occurs when an individual is being attacked by the same antigen subsequently. It is a rapid process.
- Acquired active immune response takes two distinct forms- **humoral and cell mediated response**.

# Humoral immunity and cell mediated immunity

