IMMUNITY

By

Swarnakshi Upadhyay

Assistant Professor

School of Pharmaceutical Sciences

CSJM University

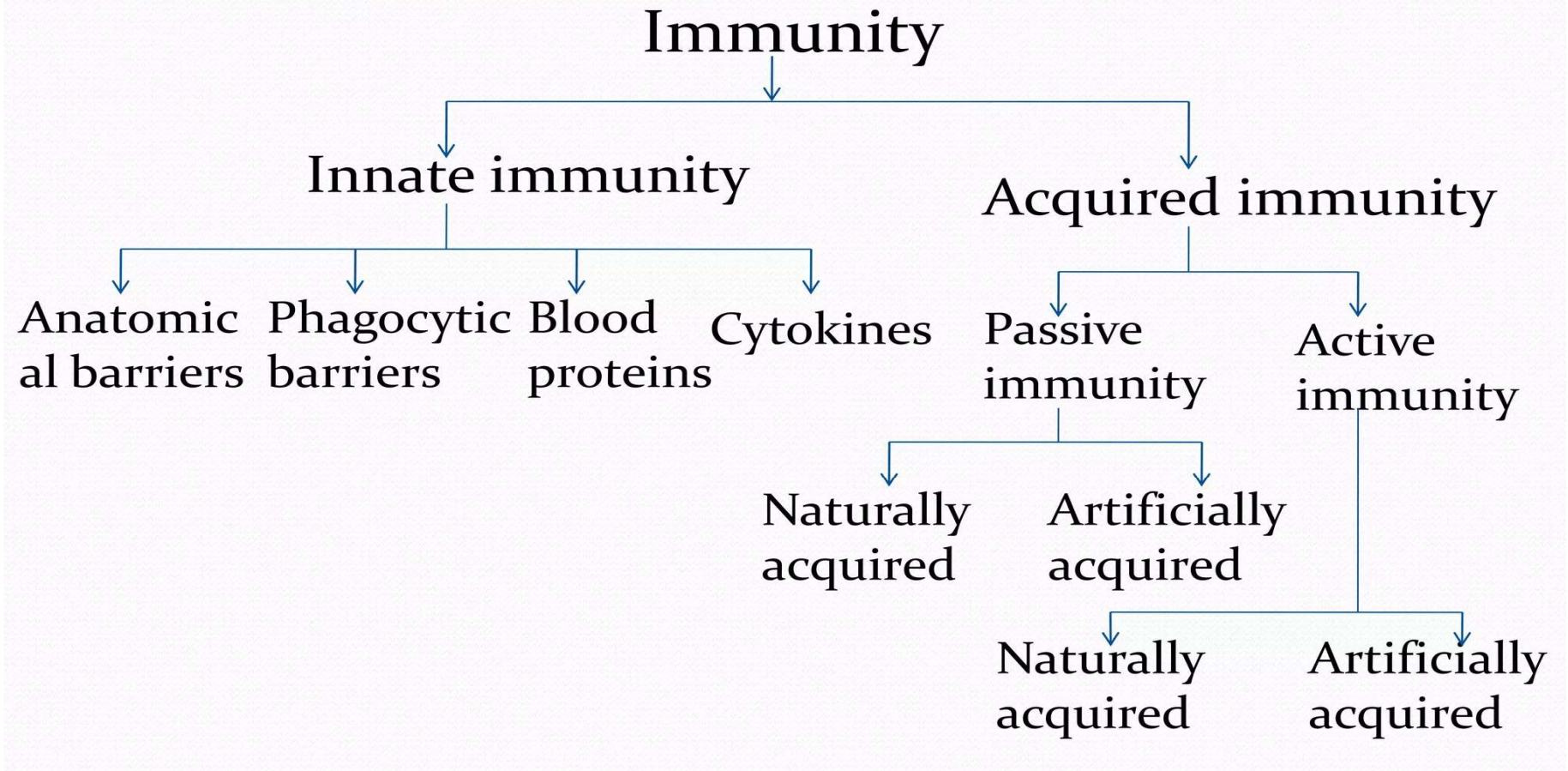
Contents

- Introduction
- Types of immunity
- Natural or innate immunity
  - Types of innate immunity
- Acquired or adaptive immunity
  - Types of Acquired immunity
- Mechanism of active immunity
- References

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.

Types of immunity



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.

Type	Mechanism
1) Anatomical barriers	
➢ Skin	Mechanical barriers retards entry of microbes. Acidic environment (pH 3–5) retards growth of microbes.
➢ Mucous membrane	Mucous entraps foreign microorganism.
2) Physiologic barriers	
➢ Temperature	Body temperature and fever response inhibits growth of some pathogens.
➢ 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** is the total immunity shown by all members of a species against pathogen; e.g. birds immune to **tetanus.**
- **Racial immunity** is that in which various races show marked difference in their resistance to certain infectious disease.
- **Individual immunity** 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

Types of Acquired Immunity

Acquired Immunity is of two types– active and 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 and Artificially acquired active immunity.

2. **Passive immunity**

Passive immunity is achieve 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 and Artificially acquired passive immunity

Mechanism of active immunity

- Body's immune system provide protection by synthesizing antibodies or immunoglobulins 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.**