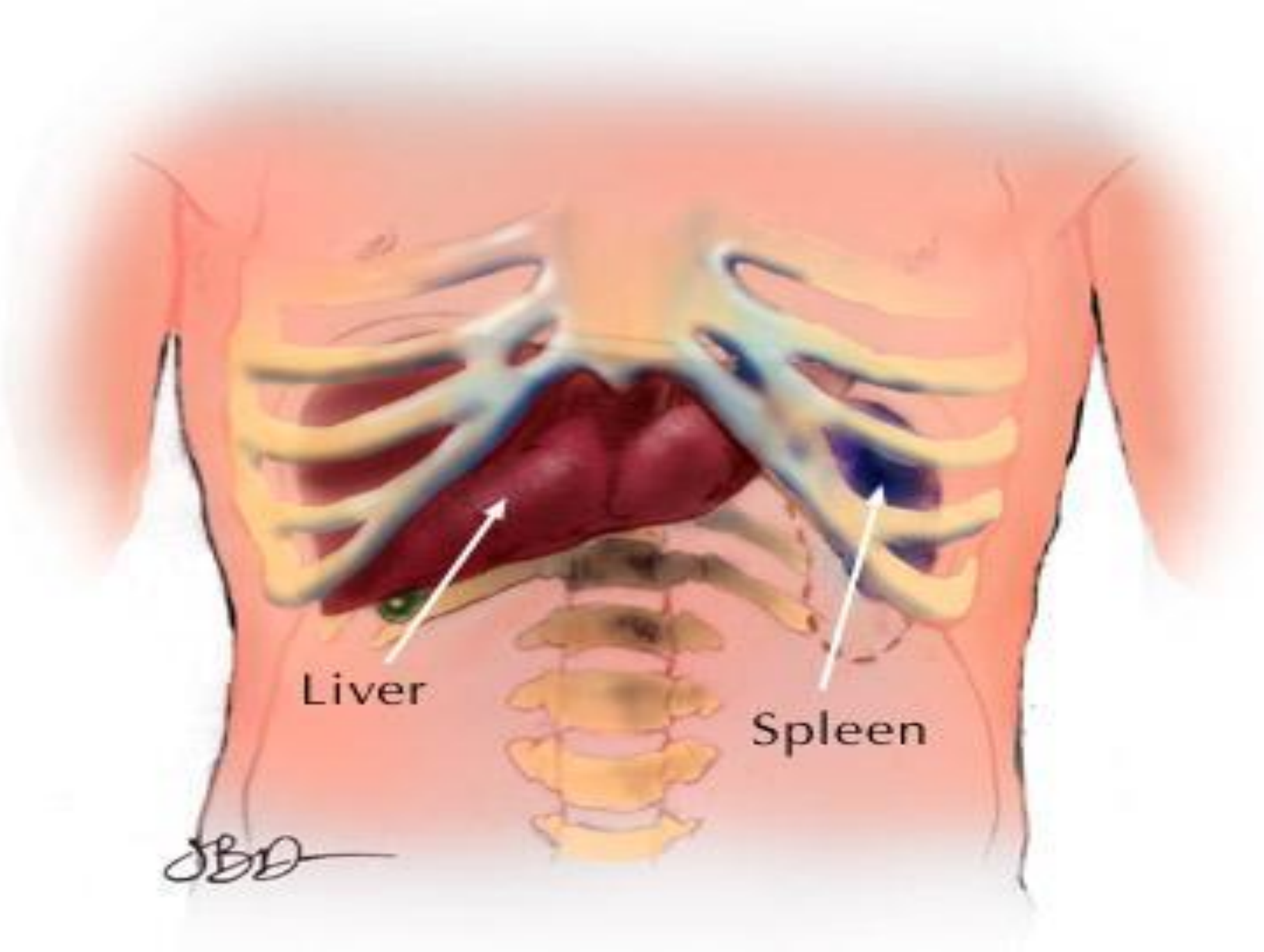
IMMUNITY SYSTEM

ORGANS OF IMMUNITY SYSTEM

- 1-Spleen
- 2-Lymph node
- 3-Glottis
- 4-Mucosol node
- 5-Thymus
- 6-Reticula – Endothelial System

Spleen

- The spleen involved in;
- - Degradation of old and dead erythrocytes
- - Production of lymphocytes active in the defense of the body
- - It is then produce red bone marrow


Liver
Spleen

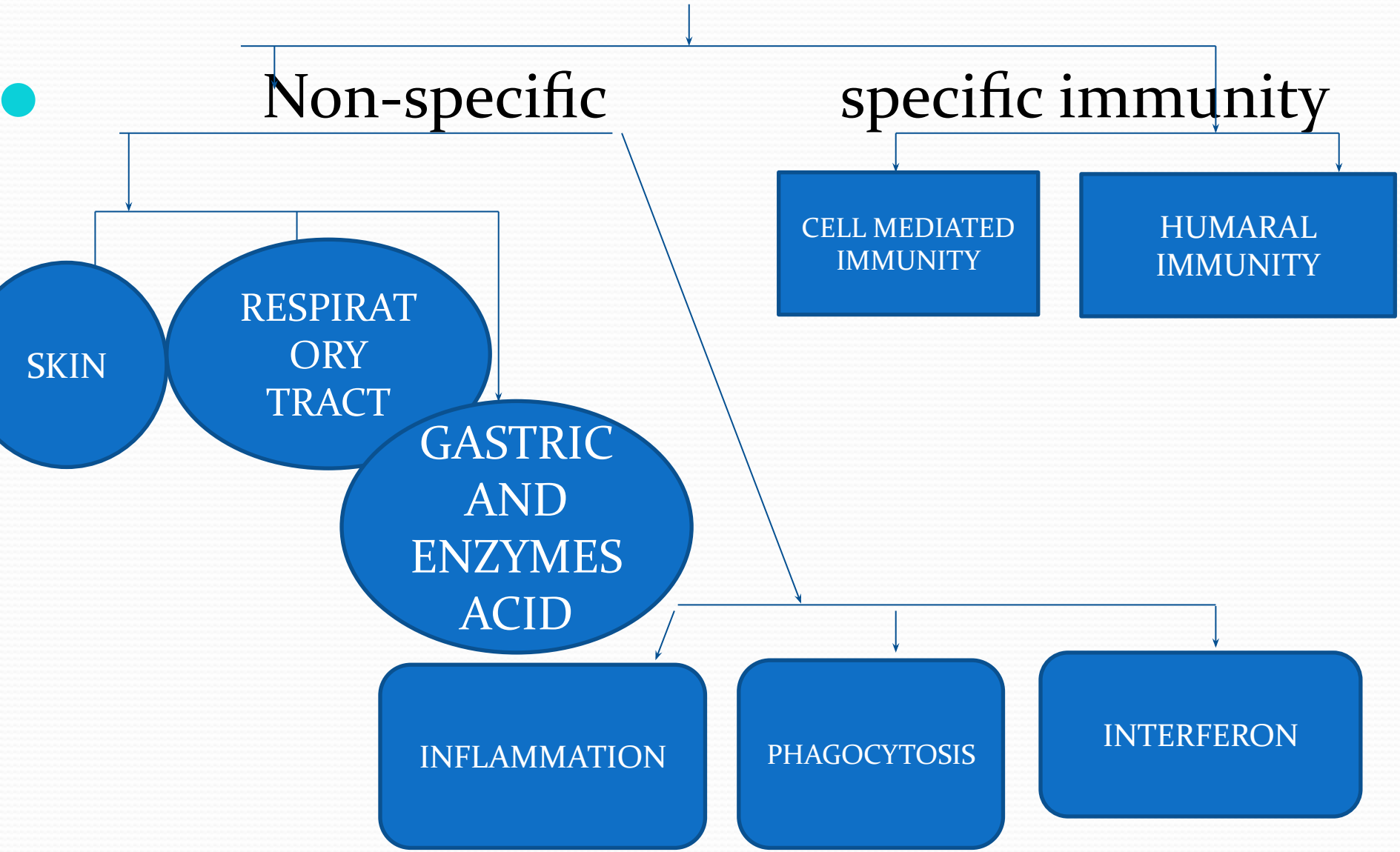
TYPES OF IMMUNITY

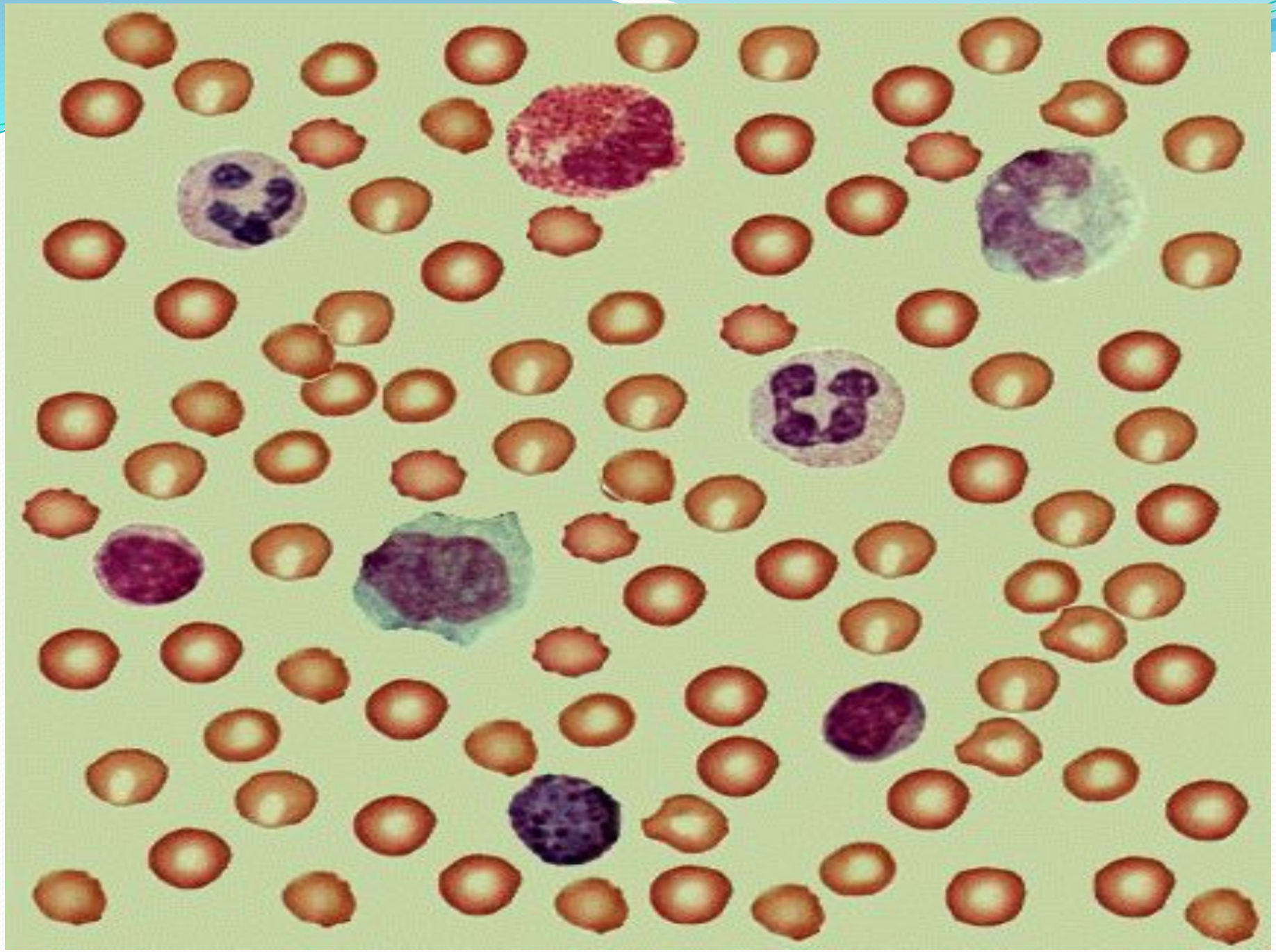
Immunity is maintained by two pathways;

1-Non- specific immunity.

2-Specific immunity.

IMMUNITY


Non-specific
specific immunity
CELL MEDIATED IMMUNITY
HUMARAL IMMUNITY
SKIN
RESPIRATORY TRACT
GASTRIC AND ENZYMES ACID
INFLAMMATION
PHAGOCYTOSIS
INTERFERON



- Acquisition of immunity

a) Active immunity

b) Passive immunity

active immunity

- 1. In the case of **active immunity**, the animal undergoes an immunological response to an antigen and produces the cells and factors responsible for the immunity, i.e., the animal produces its own antibodies and/or immuno-reactive lymphocytes. Active immunity can persist a long time in the animal, up to many years in humans.

2. Passive immunity

- 2. **Passive immunity** is the acquisition by an animal of immune factors which were produced in another animal, i.e., the host receives antibodies and/or immuno-reactive lymphocytes originally produced during an active response in another animal. Passive immunity is typically short-lived and usually persists for only a few weeks or months.

- Furthermore, either active or passive immunity may be acquired by **natural**means (e.g. self production of antibodies during infection or transfer of antibodies from mother to offspring) or by **artificial** means (i.e., vaccination and other immunization procedures). Some familiar examples of active and passive immunity are given in the table below.

Examples of Active and Passive Immunity		
Type of Immunity	How Acquired by Host	Examples
Active Immunity	As a result of exposure to an infectious agent or one of its products (antigens)	Natural: Antibodies are produced by the host in response to the infectious agent itself (e.g. recovery from the disease).
		Artificial: immunization (vaccination) with some product derived from the infectious agent (e.g. toxoid, killed cells, structural components of cells, inactivated or attenuated viruses, etc.).
Passive Immunity	As a result of the acquisition of antibodies which have been produced in another animal (by active means) or derived from cells grown in tissue culture (e.g. monoclonal antibodies)	Natural: Transplacental transfer of antibodies from mother to fetus; transfer of antibodies from mother to infant in milk by nursing.
		Artificial: Injection of immune serum from an individual previously immunized or

1-NON-SPECIFIC IMMUNITY:

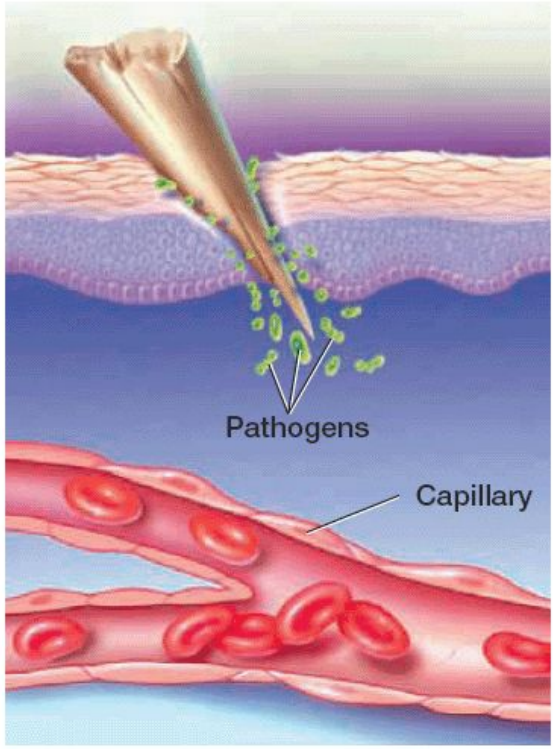
- It is maintained by three pathways; Interferon, Phagocytosis and Inflamation.

a) ***Interferon:***

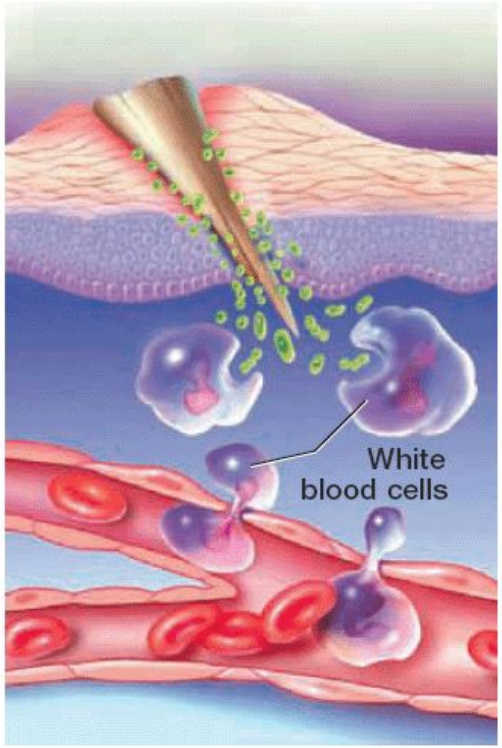
- Interferon is the term given to protein molecules which are produced by the host organisms in response to infection by a pathagenic virus, their function being to deactive viruses.
- They are non-specific to viruses however;they do occure in different forms.

- b) ***<u>Phagocytosis:</u>***
  - **Leucocytes are involved in the maintance of immunity againts pathogenic microbes.**
  - **Neuthropills are monocytes digest microbes by Phagocytosis.**

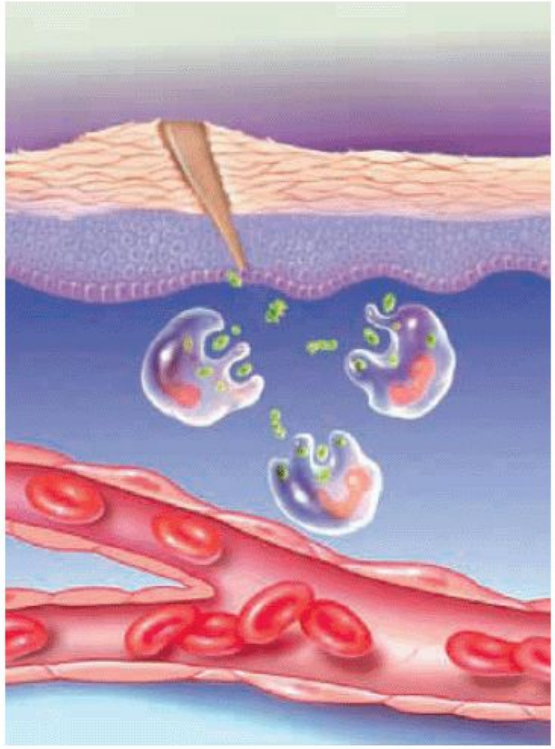
c) Inflammatory Response



1. When the skin is punctured, pathogens enter the body.



2. Blood flow to the area increases, causing swelling and redness.



3. White blood cells attack and destroy the pathogens.

SPECIFIC IMMUNITY:

Cells Involved in the Immune Response

- **Cytotoxic T cells attack and kill infected cells.**
- **B cells label invaders for later destruction by macrophages.**
- **Helper T cells activate both cytotoxic T cells and B cells.**

Figure 40–9 Humoral Immunity

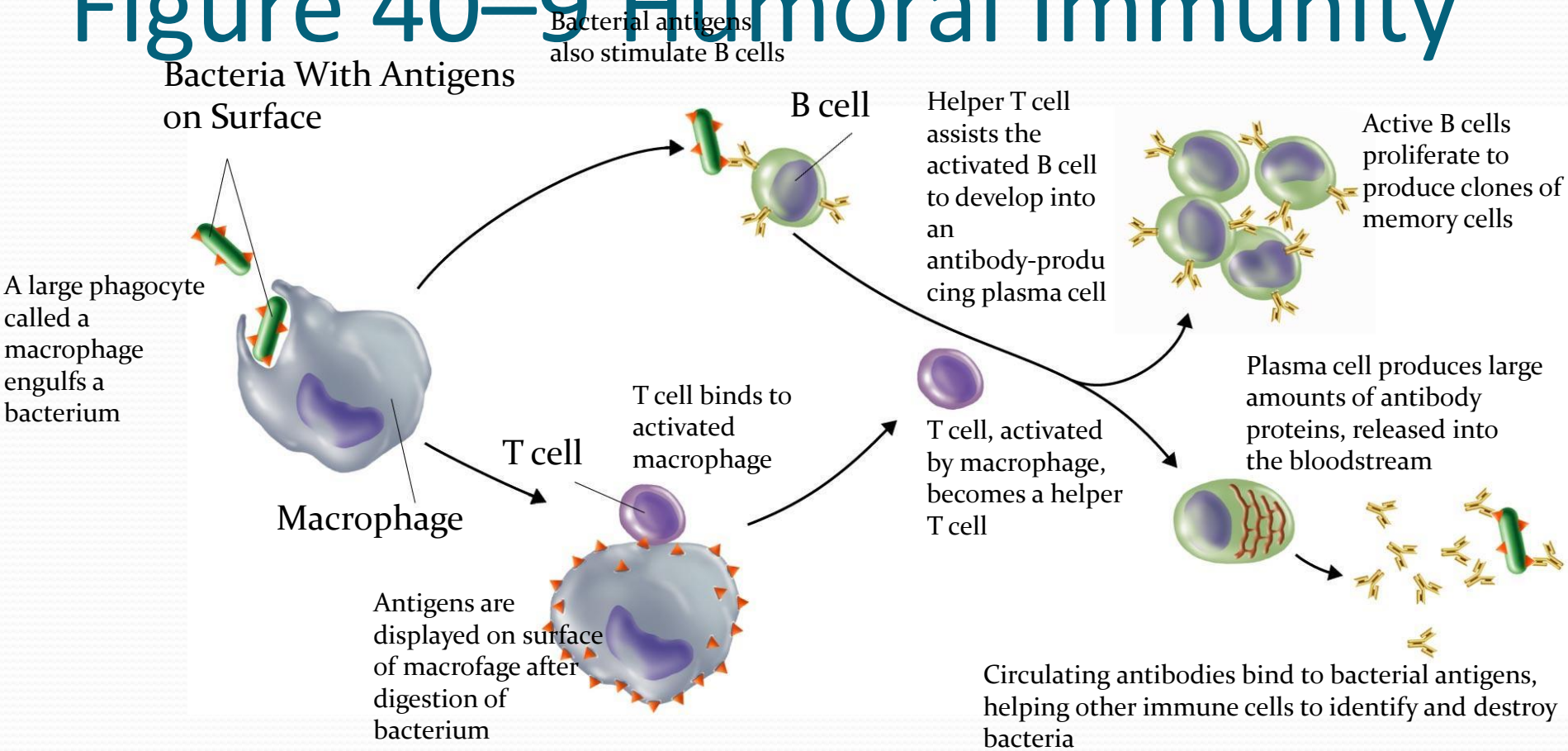
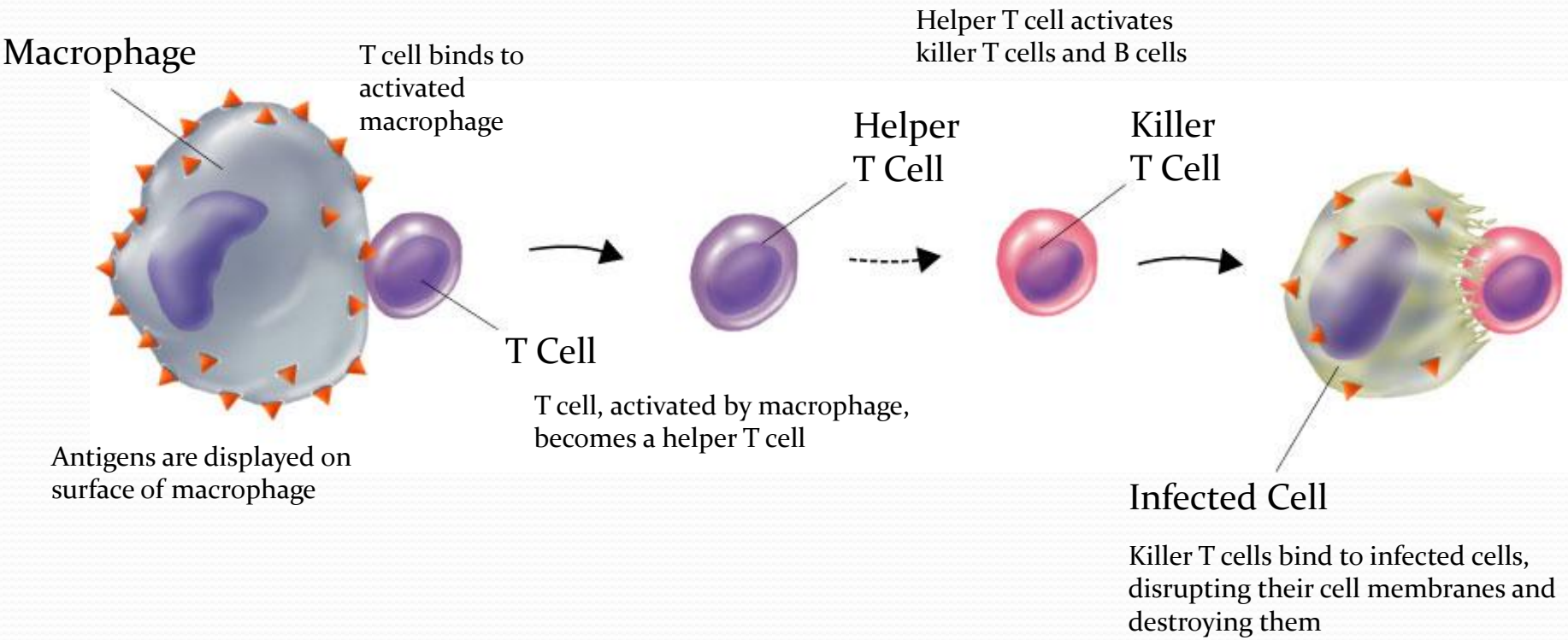


Figure 40–10 Cell-Mediated Immune Response



SPECIFIC IMMUNITY:

It is maintained by two pathways; Humeral immunity and Cell mediated immunity.

a) *Humeral immunity:*

This type of immunity is the most effective immunity agains diseas such as typhoid and diphteria.

The factors which are effective in humaral immunity.

ACQUISTION OF HUMARAL IMMUNITY

- ***ANTIGENS:***
- **Antigens consist of foreign substances that intiated the formation of antibodies againts them.**
- **When they enter the body of humans or other animals.**
- **Antigens facilate the the formation of antibodies and also react with them go inside and outside of the body.**
-
- **A factionally operational antigen should be;**
  - **in high molecular weight**
  - **recognise as hostile to the host organism**
  - **Persistant enough to remain in the host.**

Figure 40–7 The Inflammatory Response

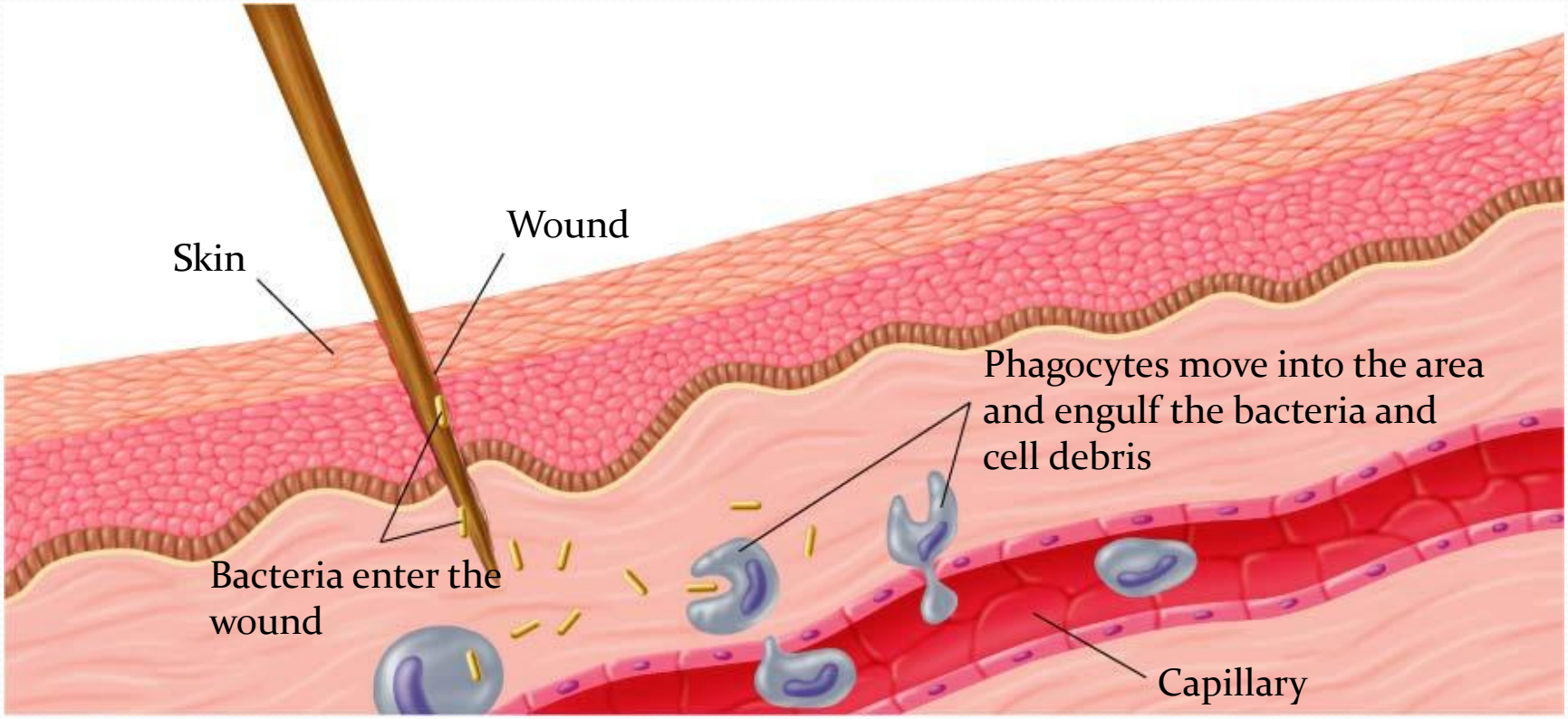
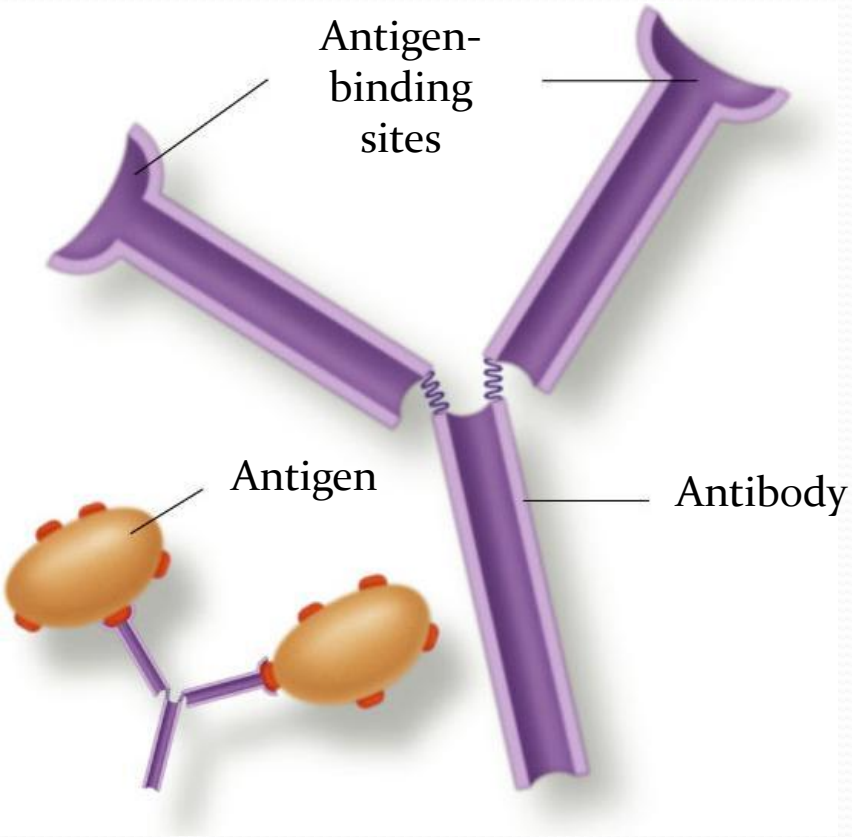
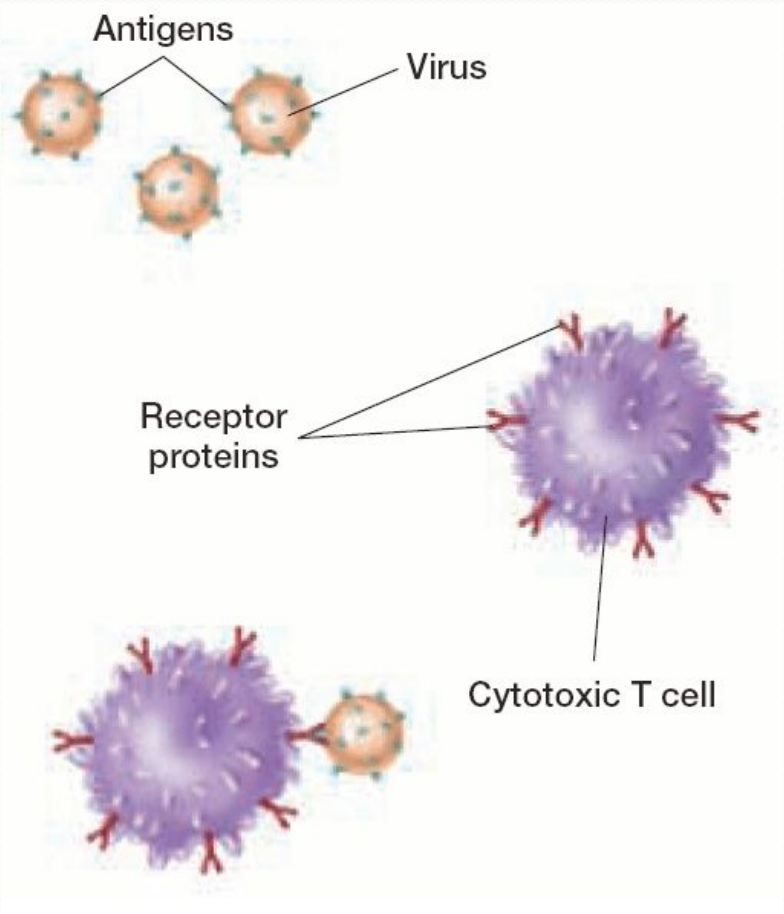


Figure 40–8 Structure of an Antibody



Specific Defenses, *continued*



Recognizing Invaders

- Some cells of the immune system have receptor proteins that bind to specific antigens.

End Of Slide

- ***ANTIBODIES:***
- **All vertabrates can synthesize antibodies.**
- **They are formed by stimulation by the antigen and react with them.they are also known as *immugloblins*.**

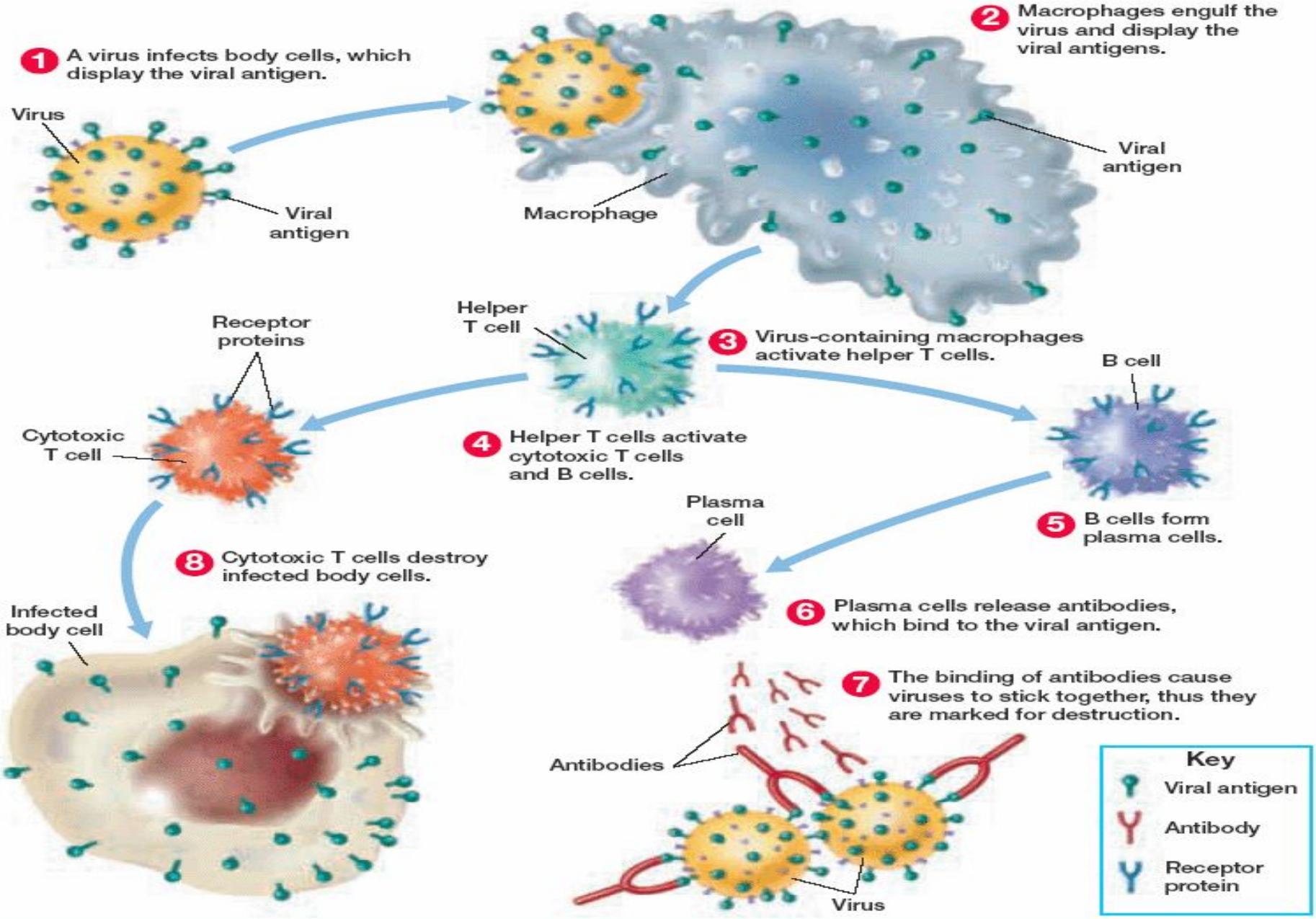
The Immune Response Has Two Main Parts

- Two distinct processes work together in an **immune response.**
- One is the **B cell response**, a defense that aids the removal of extracellular pathogens from the body.
- The other is the **T cell response**, a defense that involves the destruction of intracellular pathogens by **cytotoxic T cells.**

BIO graphic

Immune Response

The immune response involves several kinds of white blood cells.



The structure of antibodies:

- Antibodies stuctrally are globular Protents known as immunogloblins.
- Antigen – Antibody reaction.
- Antibodies are structurally peculiar to their antigens.
- A compatible antibody are antigen form an antibody-antigen complex which function as a lock and key each antibody specifically with it's antigen type.

The diseas causing organism is referned to as the pathegon and it's ability to caused diseas is called virulance.

Conerally,antibodies make dread contact with antigens.

Four different results of these reaction areas for follows: Aglulatiuation, Percipitation, Neutrilisation, Lysis.

TOXIN – ANTITOXIN:

- The human immune system can produse antitoxing againts these exotoxins.
- Antitoxin serum contains antitoxin antibodies.

ALLERGY:

- All allergies can be described as a type of response by the immune system to infection from diseases.
- The symptoms of an allergy originate from the activity of an antigens and antibodies in the lymphatic system.
- A few bacteria such as tuberculosis bacillus produce an allergic response.
- These bacteria are called allergens.

VACCINES:

- They are composed of physological fluid and weakened or dead microbe.
- Thus the body recognises the microbe and produce antibodies or antitoxides to them.
- The vaccine for each illness is there fore unique, compound vaccines administrated to together are used againts two or more deceases.
- Vaccines sustain active immunity and their effect is long term.
-

SERUM:

- The serum includes large quantities at protein antibodies.
- During illness,it is injected to the body to enhanee.
- It has a short term effect during illness.
- The serum can be produced in some animals the secrate their antibodies in to the blood.
- The rothogen is injected in increasing doses into a horse, sheep or similar organisms.