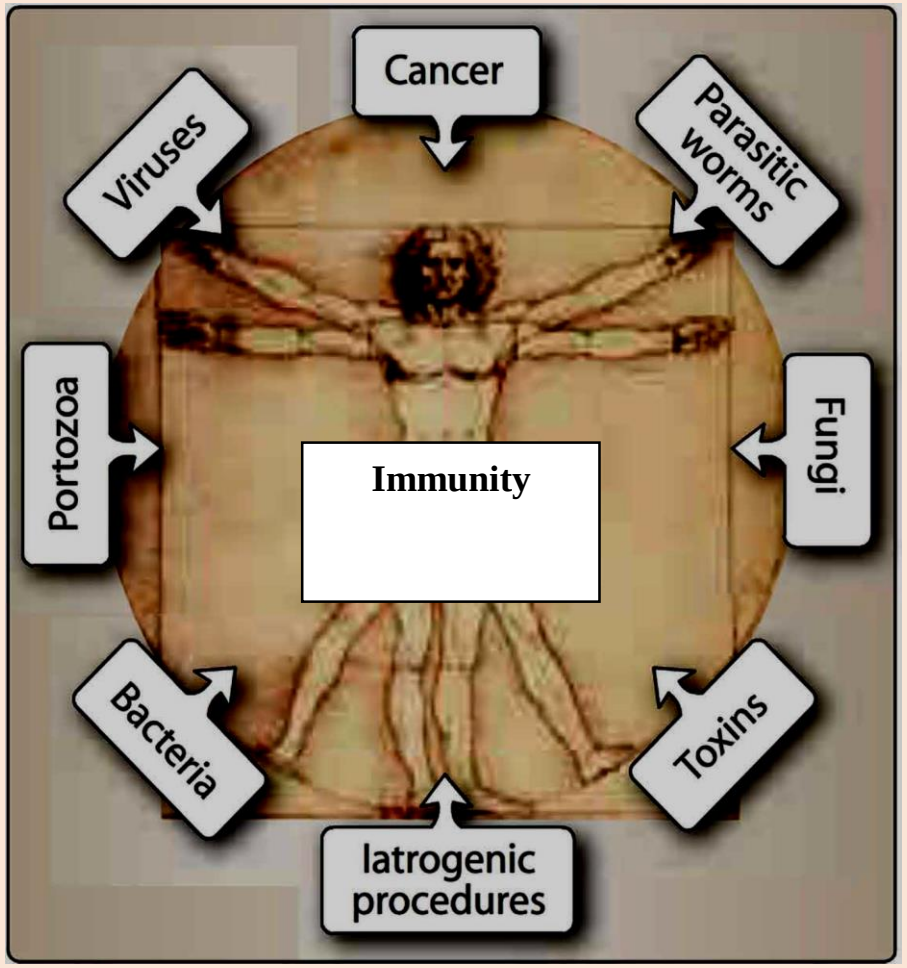
Immune system 1

The study of immune system or immunity the study of all aspects of host defense against infection and of adverse consequences of immune responses.

The study of the physiological mechanisms which enable the body to recognize materials as foreign and to neutralize, metabolize or eliminate them without injury to the host tissue.



Immune system

- Body defense Mechanisms:

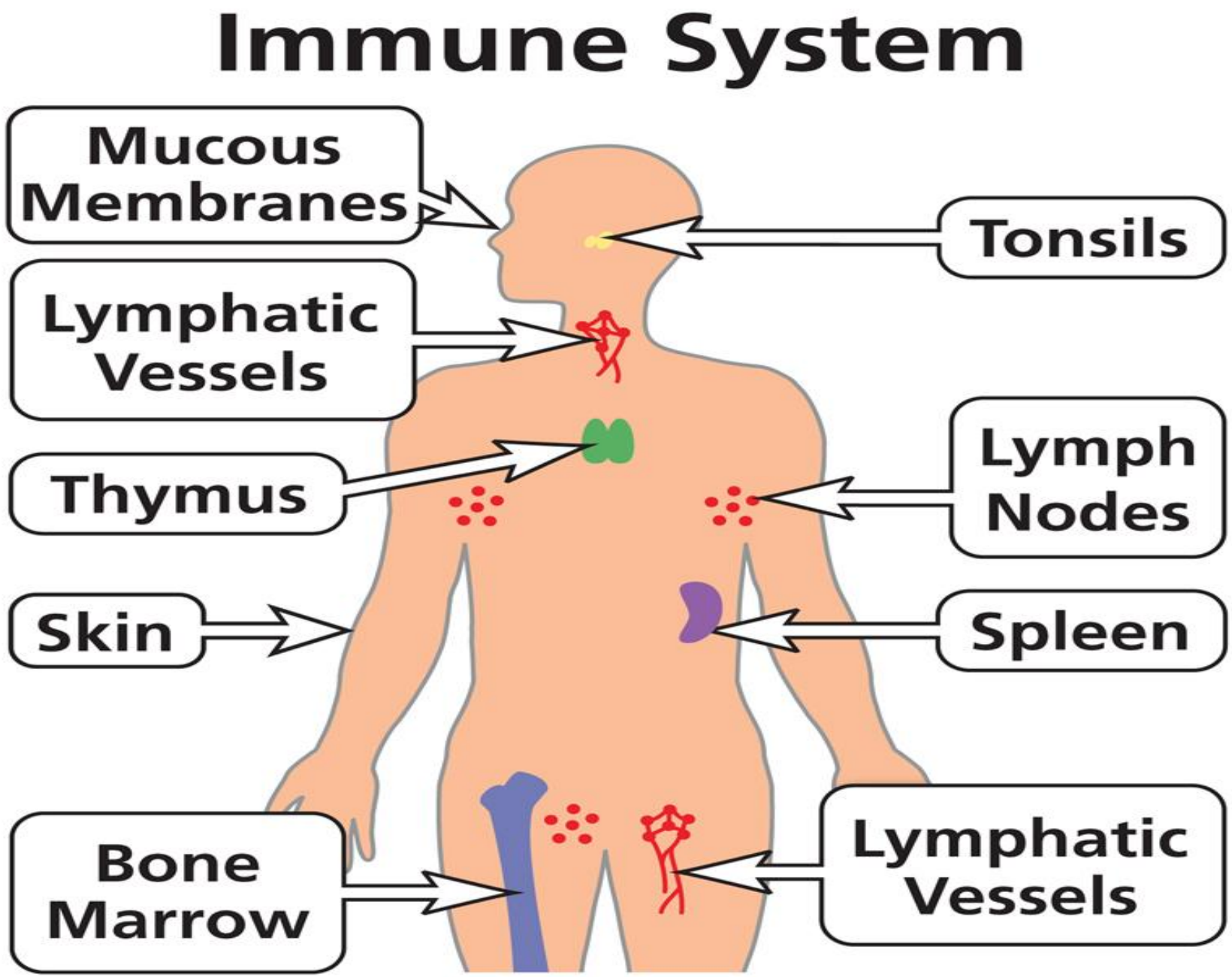
  There are three general types of defense mechanisms in the body.

  They are as following:

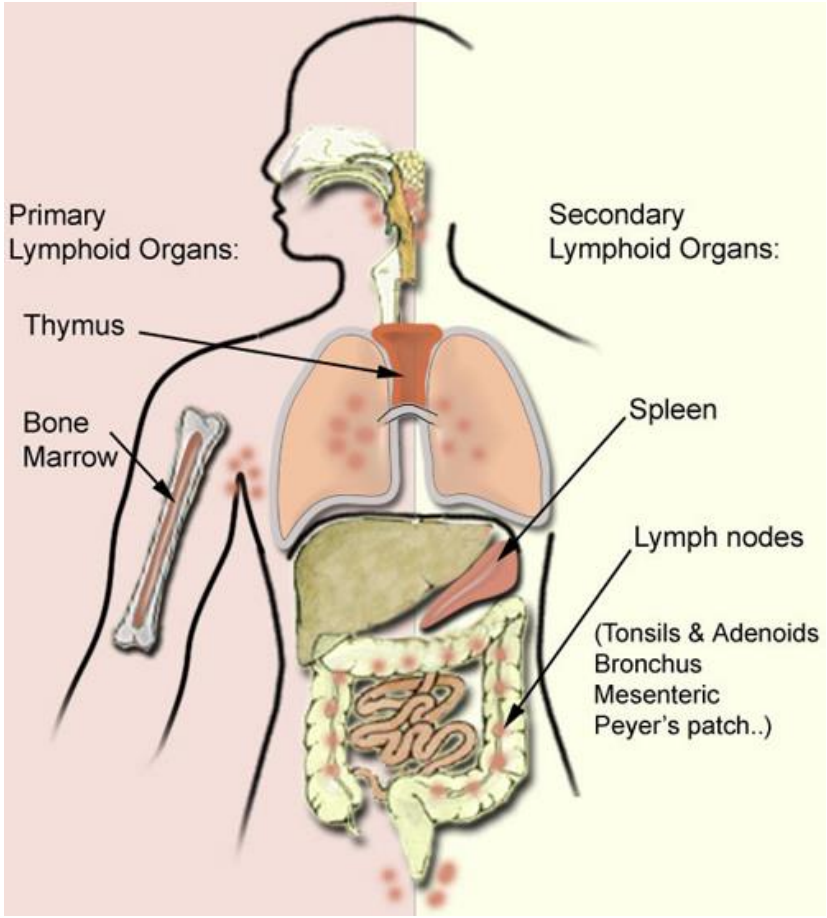
  1. Barrier system.
  2. Innate immune system.
  3. Adaptive immune system (Acquired).

See the slide.

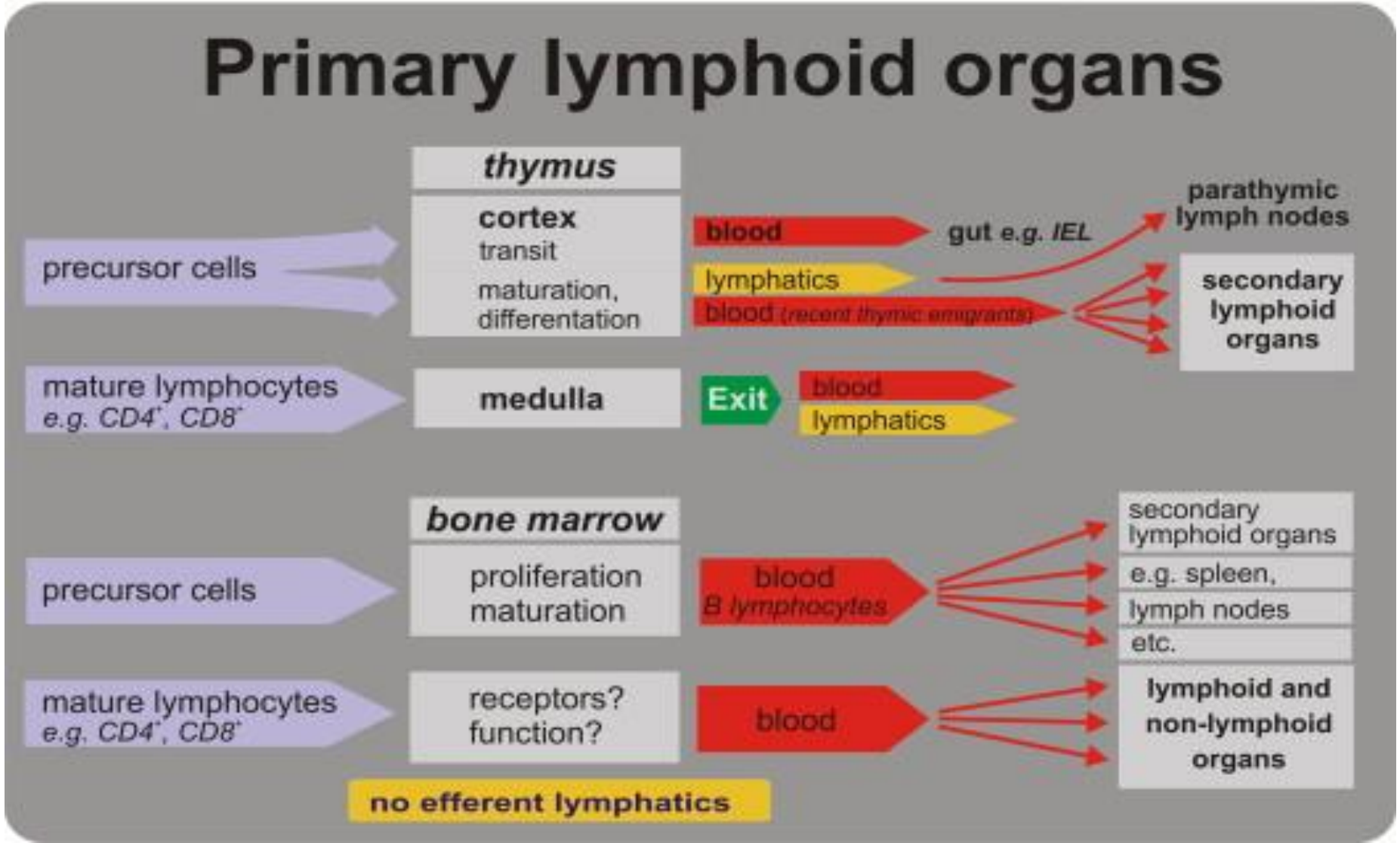
Im


Immune System
Mucous Membranes
Tonsils
Lymphatic Vessels
Lymph Nodes
Thymus
Skin
Spleen
Bone Marrow
Lymphatic Vessels

Lymphoid organs:

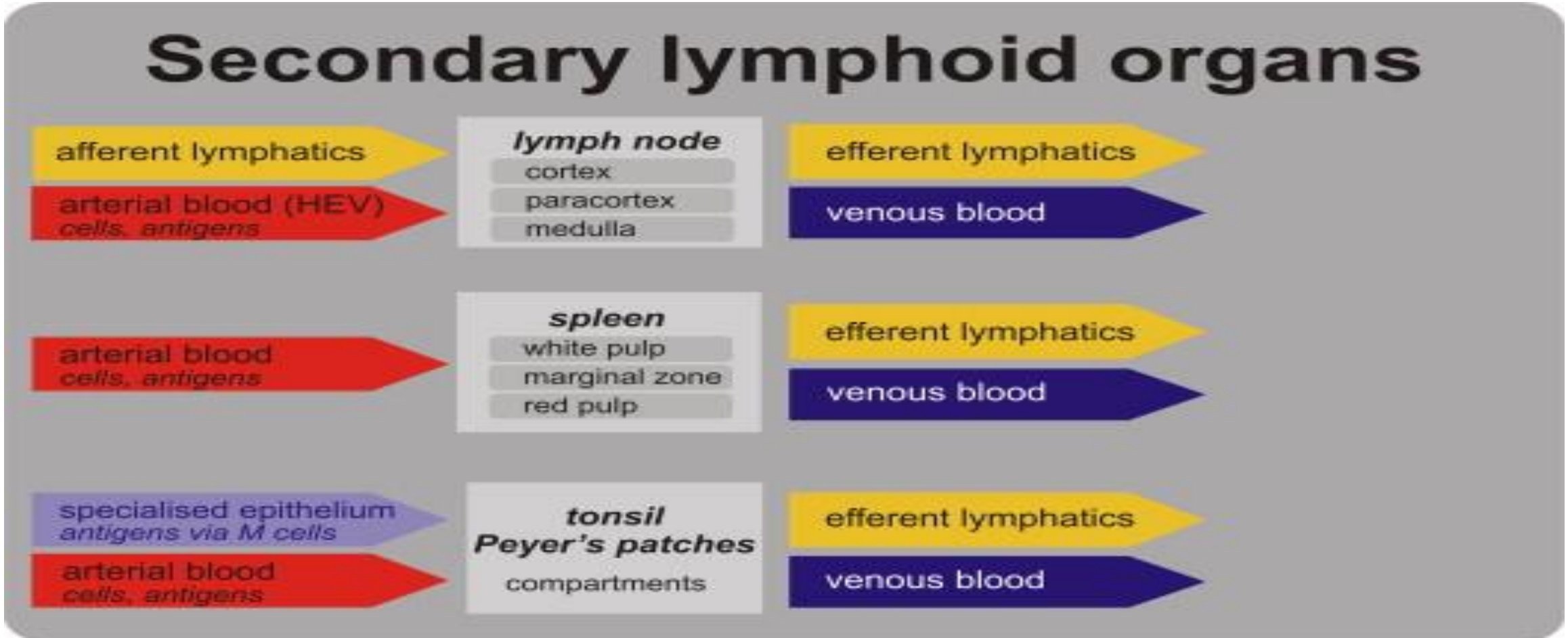


Immune system : Lymphoid organs

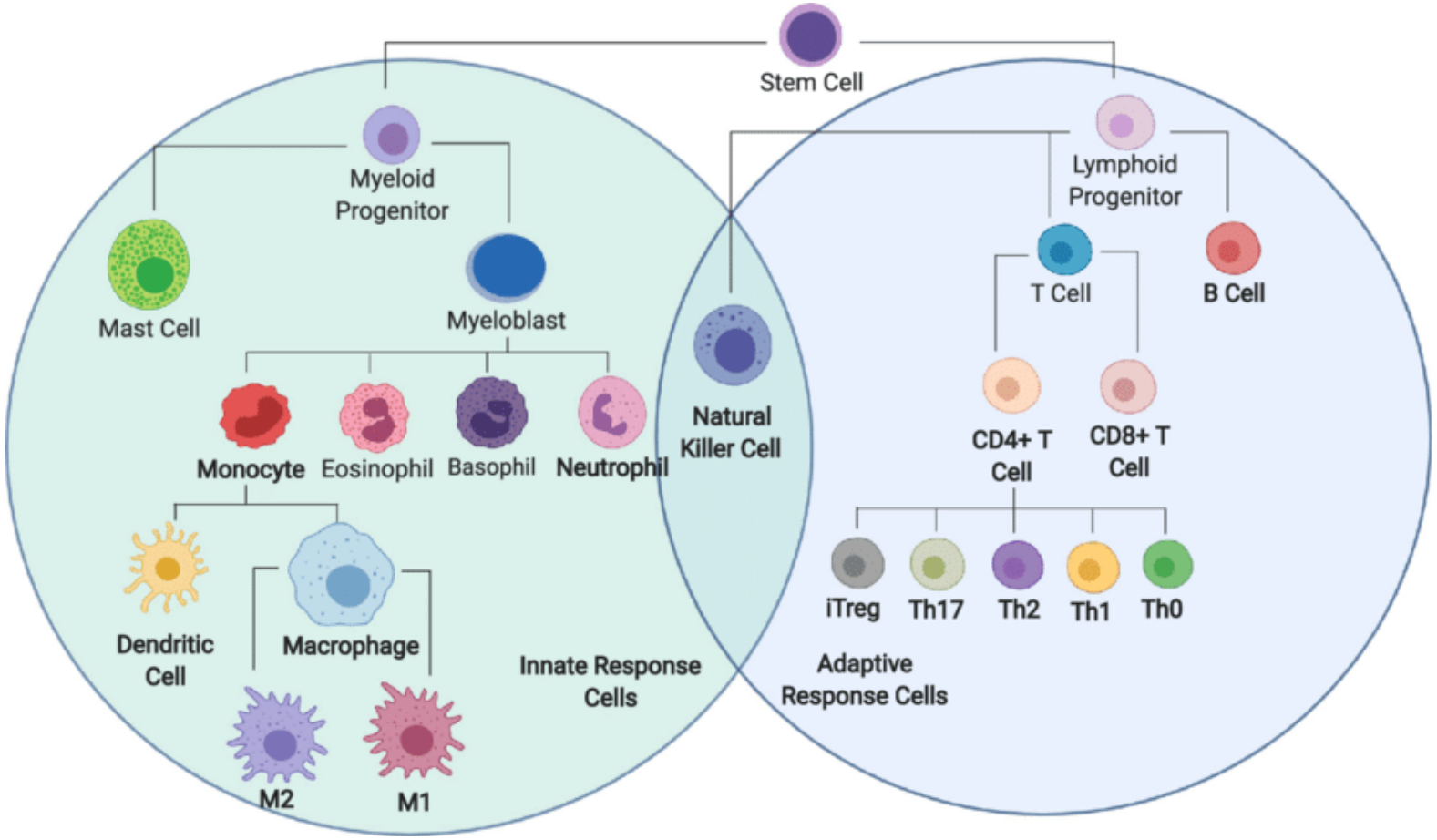


Immune system 9

- Secondary lymphoid organs



Immune system
Cells of immune system



Cellular components of the adaptive immunity;

- Immunological cells;
- **A: Lymphocytes:**
- There are three types of lymphocytes which are:

1. B-cells : its final maturation stage is plasms cells . They are the main effector cells in the humoral immunity. They are responsible of production of the antibodies.

Also they can present antigens to the T-lymphocytes.

2. T-lymphocytes : which are the active cells in both humoral and cell mediated immunity. It consists of different types which are:

- T- helper cells.
- T- suppressor cells.
- T- cytotoxic cells.
- T- regulatory cells.

The main functions of T-cells are cytotoxic and regulatory

3. Natural killers: which are active against cancer and virally infected cells. They are mainly cytotoxic.

Immune system cells

- **Immunological cells:**

B. Monocytes:

They are the main phagocytic cells. They are either circulating or resident in different organs and tissues . In blood they are either macrophages or monocytes.

In tissues have different names which are:

In liver called kupffer cells.

In lung they are called alveolar macrophages.

In the brain called microglial cells.

In kidneys they are called mesengeal cells.

In skin and mucous membranes called dendritic cells.

In bones they are called osteoclast.

The main functions of the macrophages are:

Phagocytosis.

Antigen presentation to B and T-cells.

Cytokines secretion

Immune system cells

- Immunological cells:
- **C. The granulocytes:**
- There are three types of granulocytes which are:
  - Neutrophils.
  - Eosinophils.
  - Basophils.
    (Mast cells)

They have lobulated nucleous with two to five lobules.

They have granulated cytoplasm. The granules are colored according to the type of cells.

Immune system cells

- The neutrophils:

The neutrophils has lobulated nucleous with 3to 5 lobes.

Their cytoplasmic granules are neutrally reacted with pink color.

They are active phagocytic cells.

They are active against bacterial infection.

They are the first cells migrate to the site of infection with a life span of few days.

Immune system cells

- The eosinophils:

They have also lobulated nucleous.

Their cytoplasm contains granules with acidic reaction . they are

stained orange in color.

They are active against parasitic infection . They secrete toxic materials from their cytoplasmic granules which kill the parasites.

They are also present in case of allergic reaction.

Immune system cells

- The Basophils:

They have also lobulated nucleous.

Their cytoplasm contains granules with basic reaction . they are

stained violate in color.

They are active in allergic reaction . They secrete histamine from their cytoplasmic granules which cause inflammatory and allergic reaction.