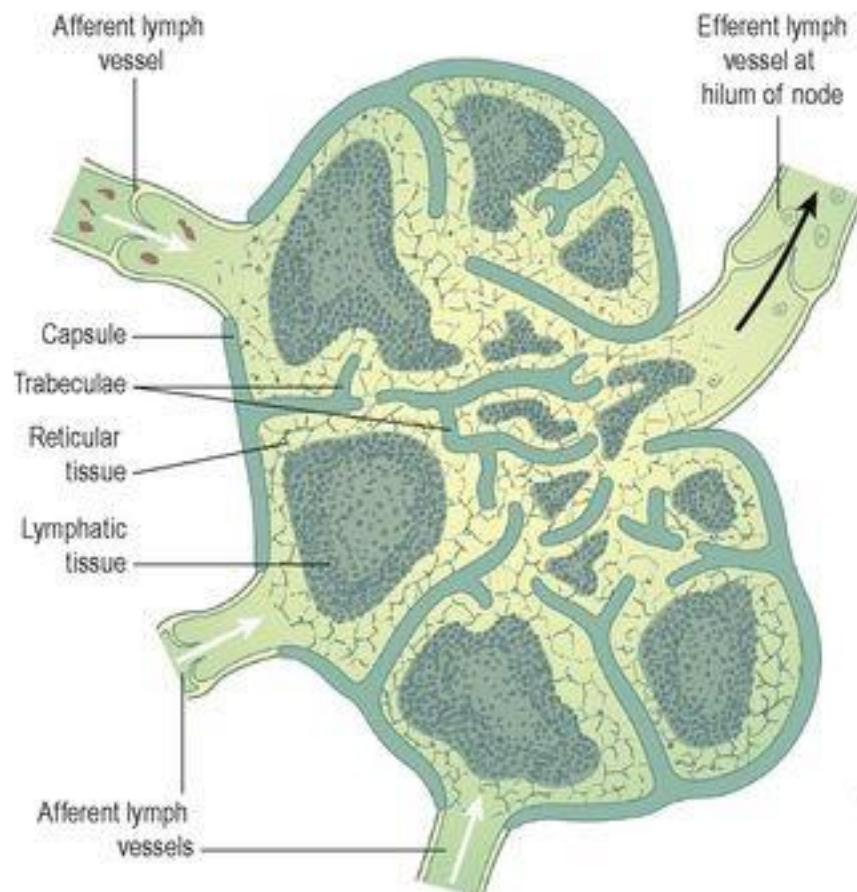


Structure

Lymph nodes have an outer capsule of fibrous tissue that dips down into the node substance forming partitions, or *trabeculae*. The main substance of the node consists of reticular and lymphatic tissue containing many lymphocytes and macrophages.



Section through a lymph node. Arrows indicate the direction of lymph flow.

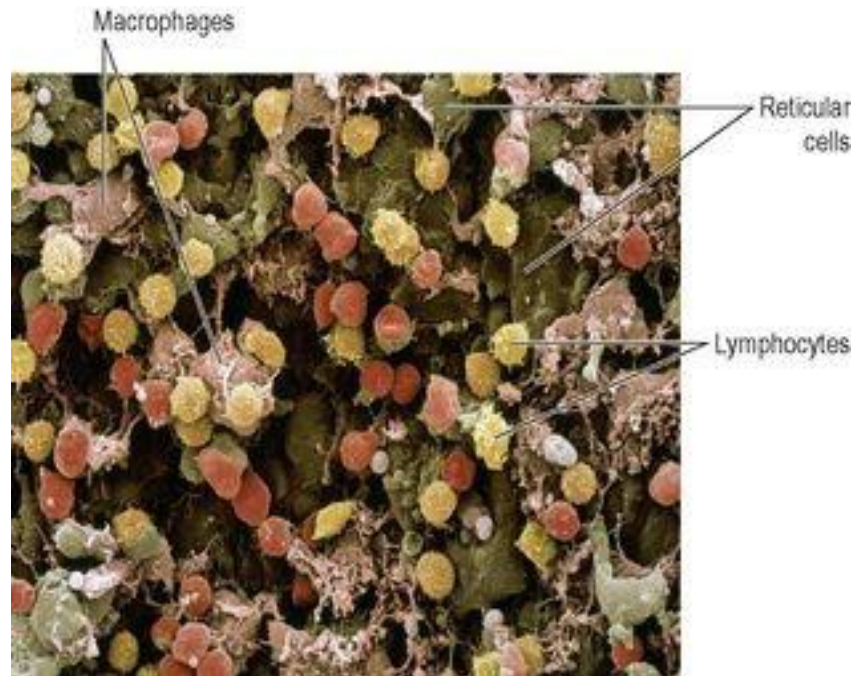
As many as four or five *afferent* lymph vessels may enter a lymph node while only one *efferent* vessel carries lymph away from the node. Each node has a concave surface called the *hilum* where an artery enters and a vein and the efferent lymph vessel leave.

The large numbers of lymph nodes situated in strategic positions throughout the body are arranged in deep and superficial groups.

Lymph from the head and neck passes through deep and superficial *cervical nodes*

Functions

- 1.Lymph is filtered by the reticular and lymphoid tissue as it passes through lymph nodes.
- 2.Particulate matter may include bacteria, dead and live phagocytes containing ingested microbes, cells from malignant tumours, worn-out and damaged tissue cells and inhaled particles.
- 3.Organic material is destroyed in lymph nodes by macrophages and antibodies.
- 4.Some inorganic inhaled particles cannot be destroyed by phagocytosis. These remain inside the macrophages,either causing no damage or killing the cell.
- 5.Material not filtered out and dealt with in one lymph node passes on to successive nodes and by the time lymph enters the blood it has usually been cleared of foreign matter and cell debris.
- 6.In some cases where phagocytosis of bacteria is incomplete they may stimulate inflammation and enlargement of the node (*lymphadenopathy*



**Colour scanning electron micrograph of lymph node tissue.
Function of Spleen**

1. Phagocytosis- old and abnormal erythrocytes are mainly destroyed in the spleen, and the breakdown products, bilirubin and iron, are transported to the liver via the splenic and portal veins. Other cellular material, e.g. leukocytes, platelets and bacteria, is phagocytosed in the spleen. Unlike lymph nodes, the spleen has no afferent lymphatics entering it, so it is not exposed to diseases spread by lymph.

2. Storage of blood

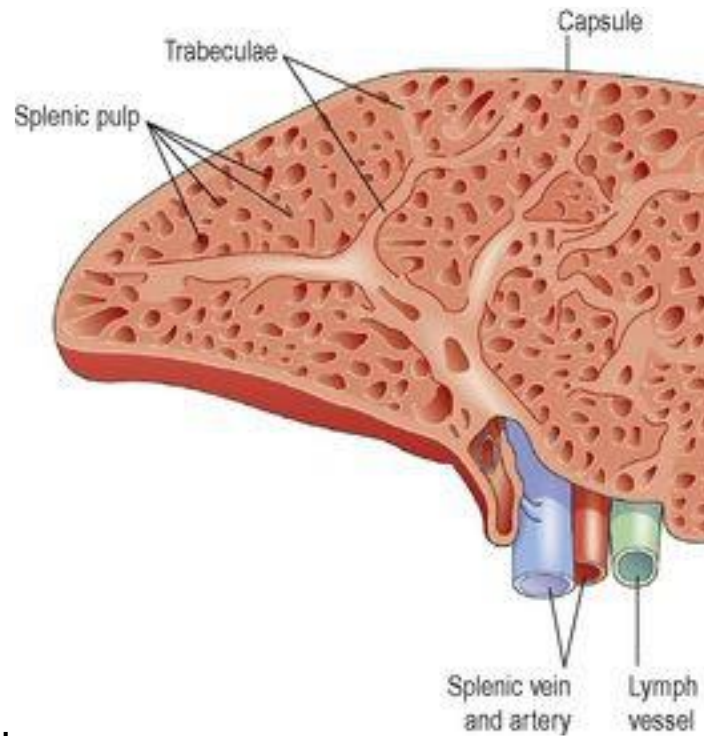
The spleen contains up to 350 ml of blood, and in response to sympathetic stimulation can rapidly return most of this volume to the circulation, e.g. in haemorrhage.

3. Immune response

The spleen contains T- and B-lymphocytes, which are activated by the presence of antigens, e.g. in infection. Lymphocyte proliferation during serious infection can cause enlargement of the spleen (*splenomegaly*).

4.Erythropoiesis

The spleen and liver are important sites of fetal blood cell production, and the spleen can also fulfil this function in adults in times of great need.



Structure of spleen