

# Cells of the Lymphatic System and Immune System

The lymphatic system is full of specialized immune cells that defend the body.

The lymphatic system works like a team:

- Lymphocytes are the strategists and memory keepers.
- Phagocytes are the frontline fighters.
- Supporting cells maintain structure, signal danger, and regulate inflammation.

## 1. Lymphocytes

These are the core cells of adaptive (specific) immunity, responsible for recognizing and remembering specific invaders.

- **B-Cells**
  - Mature in the bone marrow
  - Make antibodies that attach to specific antigens on germs
  - Can become memory B-cells for long-term immunity
- **T-Cells**
  - Mature in the thymus
  - Helper T-cells (CD4) – coordinate other immune cells, send signals
  - Cytotoxic T-cells (CD8) – kill infected or abnormal cells
  - Memory T-cells – remember previous infections for faster response

## 2. Natural Killer (NK) Cells

- Part of innate (nonspecific) immunity
- Attack virus-infected cells or cancer cells directly
- Don't need prior exposure to a pathogen to act

## 3. Phagocytes

These are the 'eating cells' that engulf and destroy invaders.

- **Macrophages** – large cells that live in tissues and lymph nodes; engulf bacteria and dead cells
- **Neutrophils** – the first responders to infection; attack bacteria quickly
- **Dendritic cells** – capture antigens and show them to T-cells to activate adaptive immunity

## 4. Other Supporting Cells

- **Reticular cells** – form the structural network of lymph nodes and the spleen, supporting immune cell organization
- **Mast cells** – release chemicals like histamine during inflammation or allergic reactions
- **Plasma cells** – B-cells that have matured to produce antibodies

# CELLS OF THE LYMPHATIC SYSTEM AND IMMUNE SYSTEM <

Cell Type	Function	Location
B-cells	Make antibodies, memory for future immunity	Bone marrow, lymph nodes
T-cells	Kill infected cells, coordinate immune response, memory	Thymus, lymph nodes
Natural Killer cells	Attack infected/cancerous cells without prior exposure	Blood, lymph nodes
Macrophages	Engulf pathogens, clean debris	Tissues, lymph nodes
Neutrophils	First responders, phagocytose bacteria	Blood, tissues
Dendritic cells	Capture antigens, activate T-cells	Skin, mucous membranes, lymph nodes
Plasma cells	Mature B-cells that produce antibodies	Bone marrow, lymph nodes
Mast cells	Release histamine, trigger inflammation	Tissues
Reticular cells	Structural support in lymph nodes and spleen	Lymph nodes, spleen