

M.Sc ZOOLOGY
SEMESTER 3
PAPER CC 10
INFLAMMATION

Dr.Anjali Gupta
Associate professor
Department of zoology
H.D.Jain College
ARA

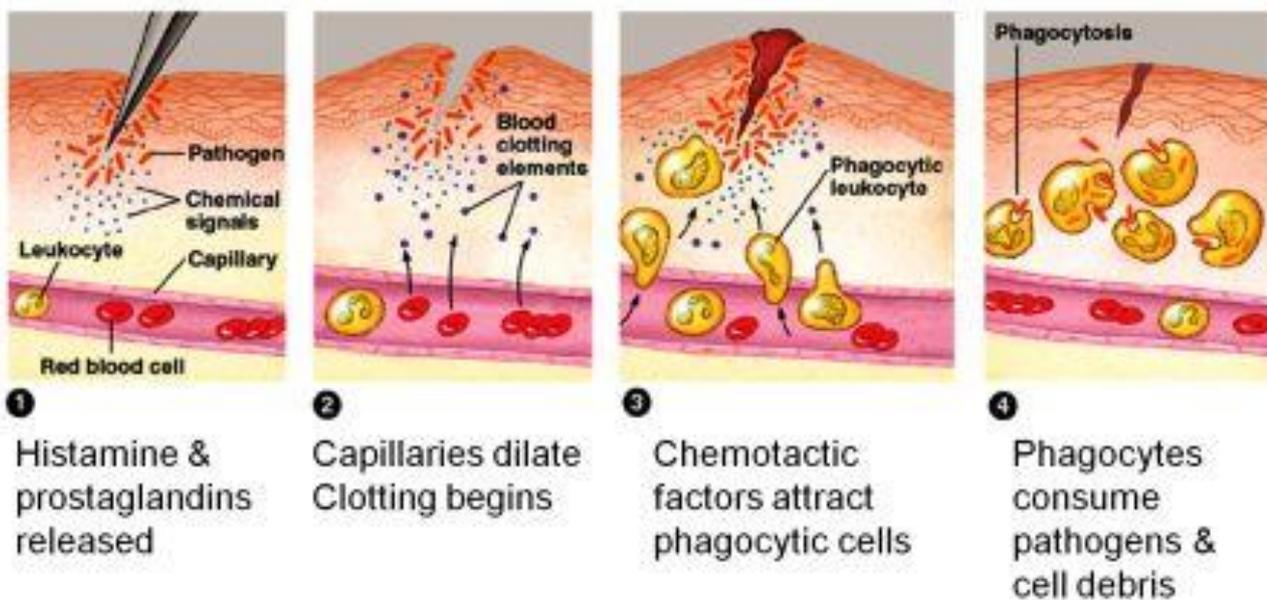
Inflammation or Inflammatory barrier of immune system

- **Inflammation** is an important defense mechanism of host to prevent infection. It is induced in response to tissue damage caused by microorganism, toxins or by mechanical means.
- The inflammation may be acute; for e.g. in response to tissue damage or chronic; for e.g. Arthritis, cancer etc.
- Main aim of inflammation is to prevent spread of injected microorganism or toxin from site of injection and kill them on spot by phagocytosis.

Characteristics of inflammation:

1. Rubor: redness
2. Tumor: swelling
3. Calor: heat
4. Dolor: pain
5. Functio laesa: loss of function

Steps of inflammatory response



Step I: Tissue damage and Release of histamine:

- Tissue damage caused by toxin, microorganism or mechanical injury release histamine.

Step II: Vasodilation:

- Histamine acts on surrounding blood capillaries and causes vasodilation.
- When vasodilation occurs, speed of blood flow decreases so that Neutrophils get chance to settle at the site of infection.

Step III: Increased permeability:

- At the same time histamine increases the permeability of blood capillaries leading to leakage of fluid from blood capillaries. This results in accumulation of fluid causing edema.

Step IV: Extravasation:

- **Within a few hours, neutrophils** migrates to the site of tissue damage by the process of chemotaxis and passes through capillaries wall and enters into tissue space by the process called extravasation...
- **Extravasation completes in four steps.**
- **ROLLING:** Neutrophils attached loosely to the endothelium by low affinity interaction between glycoprotein-mucin of neutrophils.
- **ACTIVATION OF CHEMOSTATIC STIMULUS:** Chemokines are secreted and neutrophils are attracted.
- **AREST AND ADHESION:** ICAMS and intergrin stabilise adhesion of neutrophils and endothelium.
- **TRANSENDOTHELIAL MIGRATION:** Neutrophil enters through endothelium.

Step V: Phagocytosis:

- Neutrophil kills the injected microorganism or toxins by phagocytosis and release molecular mediators that contributes to inflammatory response. At the same time activates effectors cells.

Step VI: Inflammatory response:

- As inflammatory response develops, various cytokines and other inflammatory mediators act on endothelium of local blood vessels, including

increased expression of cell adhesion molecules (CAMs). The epithelium is then said to be inflamed.

- Neutrophils are the first cell types to bind to inflamed endothelium and extravasate into tissue.



The Inflammatory response

