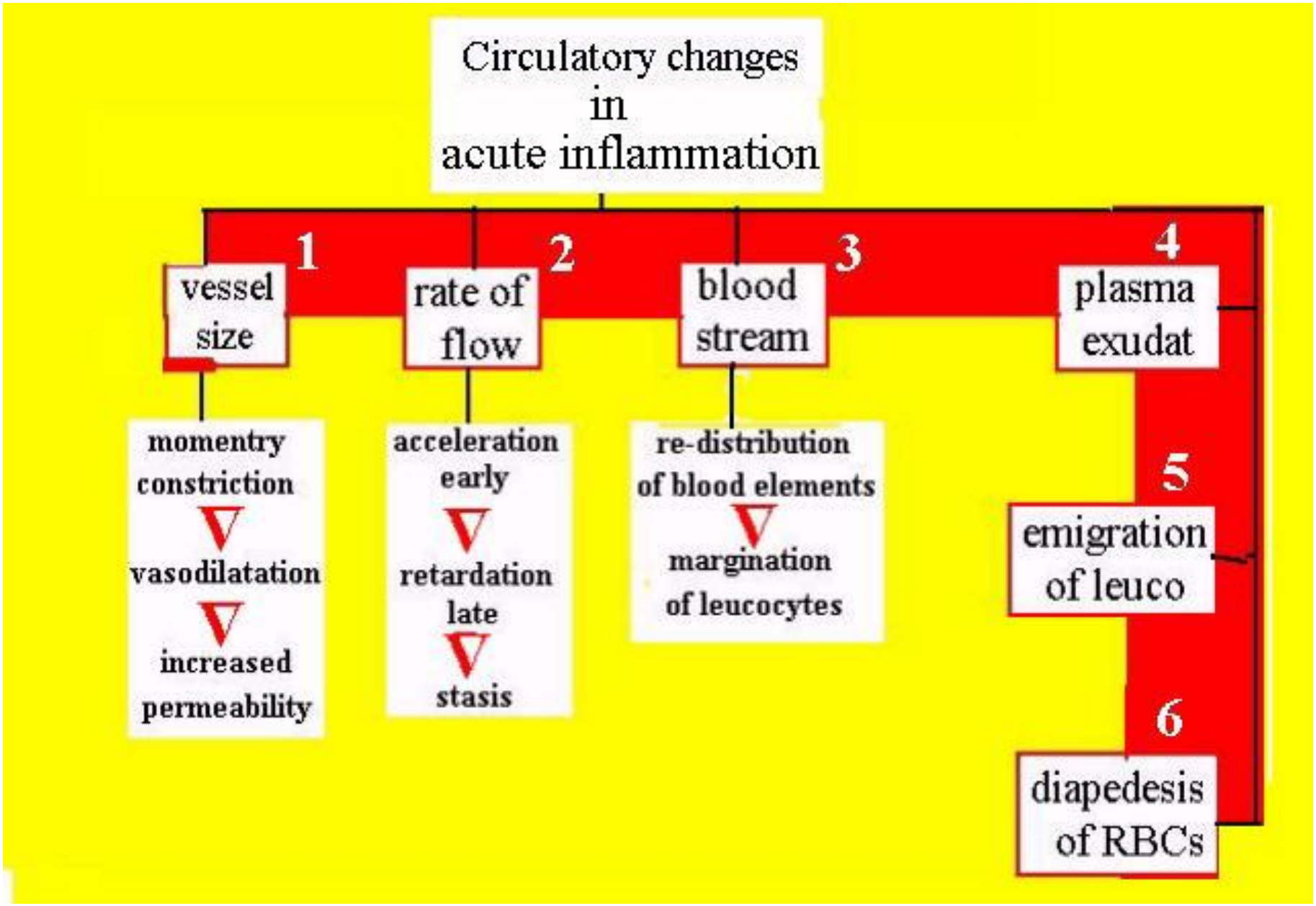
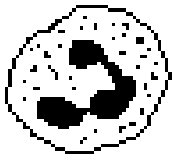
Inflammation-2

Inflammation

- It is the **local response** of the body to the tissue injury

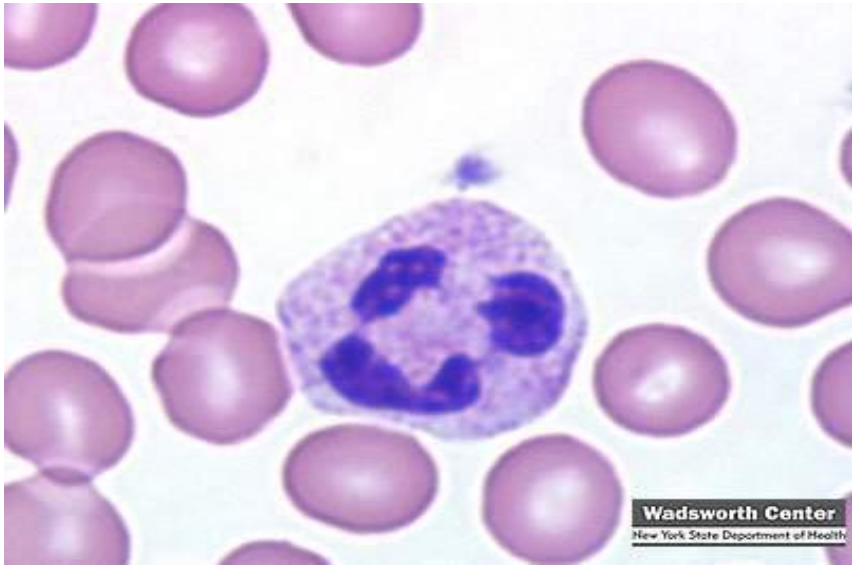

Circulatory changes
in
acute inflammation
1
vessel
size
momentry
constriction
vasodilatation
increased
permeability
2
rate of
flow
acceleration
early
retardation
late
stasis
3
blood
stream
re-distribution
of blood elements
margination
of leucocytes
4
plasma
exudat
5
emigration
of leuco
6
diapedesis
of RBCs

MARGINATION



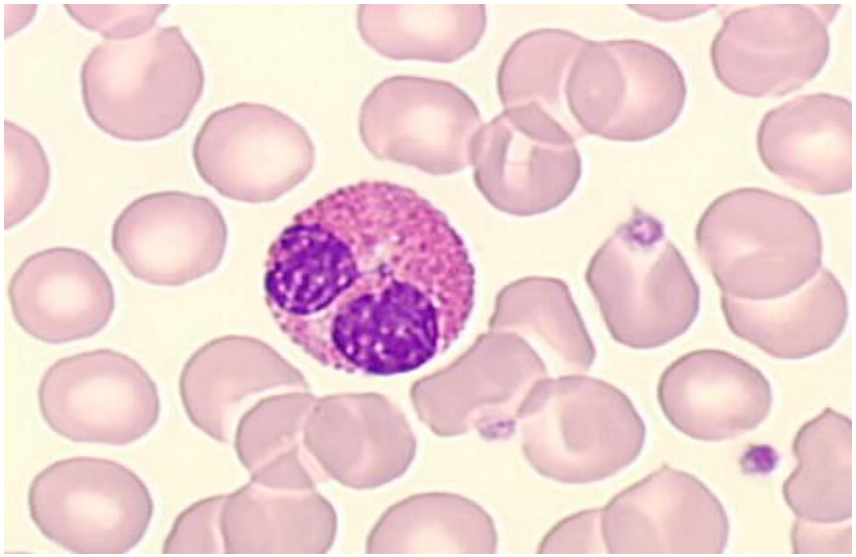
Cellular changes
Neutrophils

- 1st. Line of defense
- Amoeboid movement
- Phagocytic cells
- Numerous in bacterial infection



Cellular changes
Eosinophils

- Amoeboid movement
- Not phagocytic
- Numerous in parasitic infestation (allergy-asthma



Cellular changes
Basophils

- **Not phagocytic**
- **Produce heparin , ch. Mediator (histamine-PAF-, slow reacting substance of anaphylaxis) and chemotactic substance**

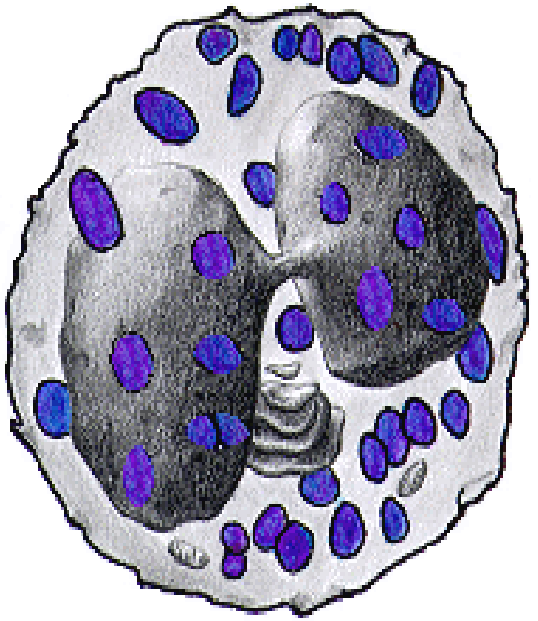
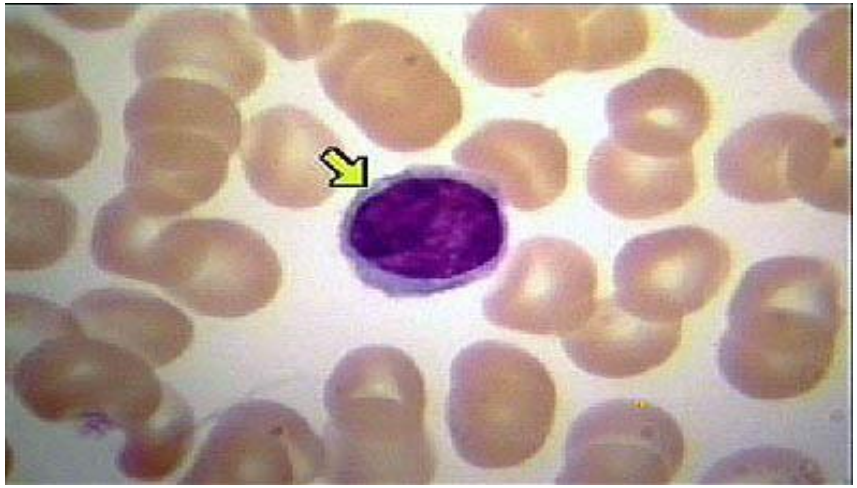


Fig. 10 - Basophile

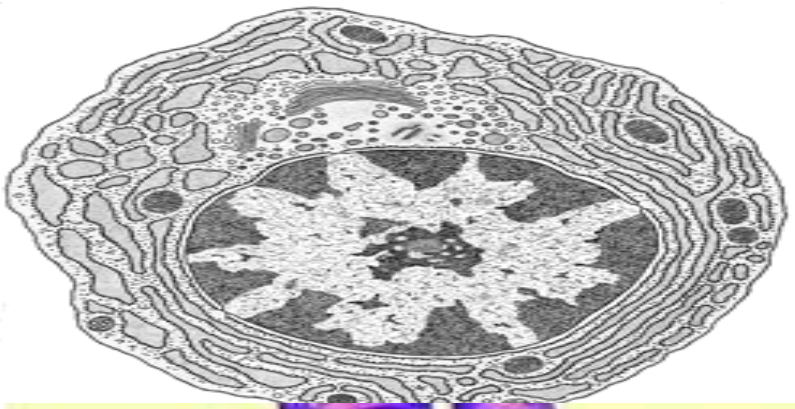
Cellular changes lymphocytes

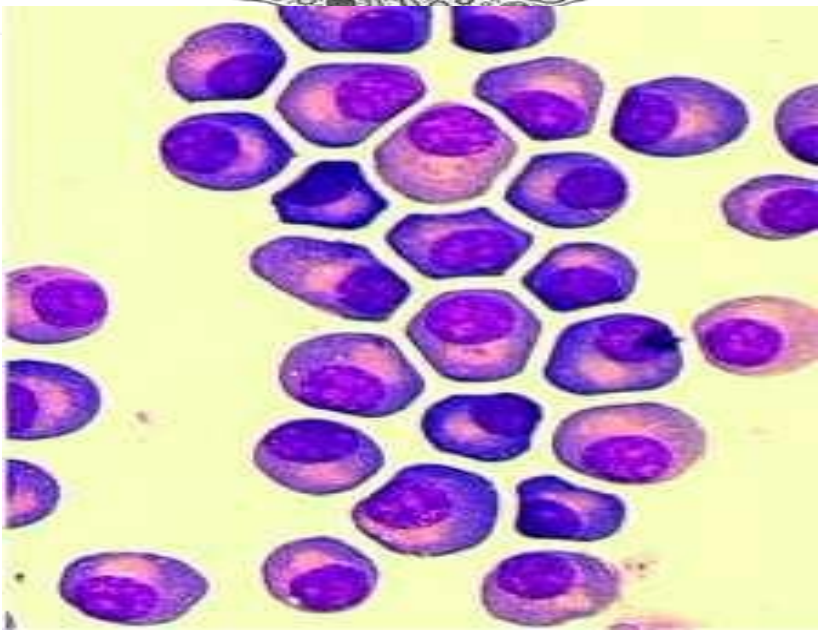
- Limited amoeboid movement
- Two types : T-lymphocytes (secrete lymphokinees) and B-lymphocytes (ab production)
- Numerous in viral infection , chronic diseases
- In the inflamed area, they found perivascular cuffing
- They synthesize nucloproteins for other cells
- They produce lipase and proteinase



III- Cellular changes plasma cells

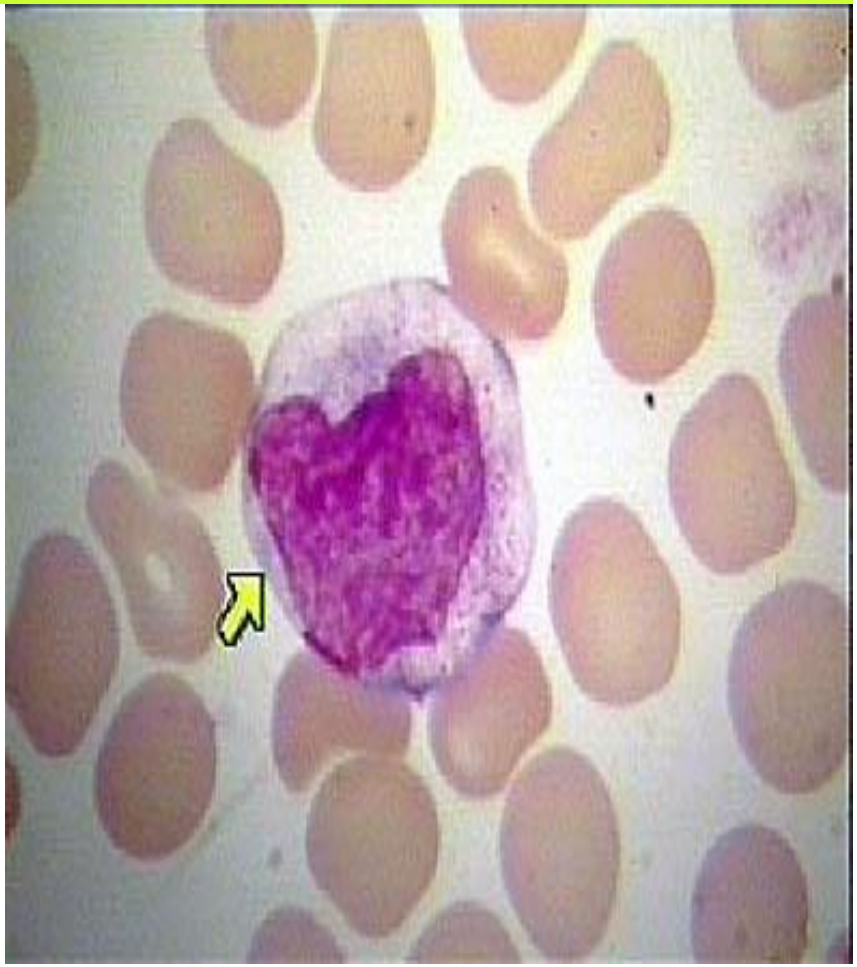
- They are not normally found the circulating blood
- They undergo mitosis
- Limited amoeboid movement
- They produce ab





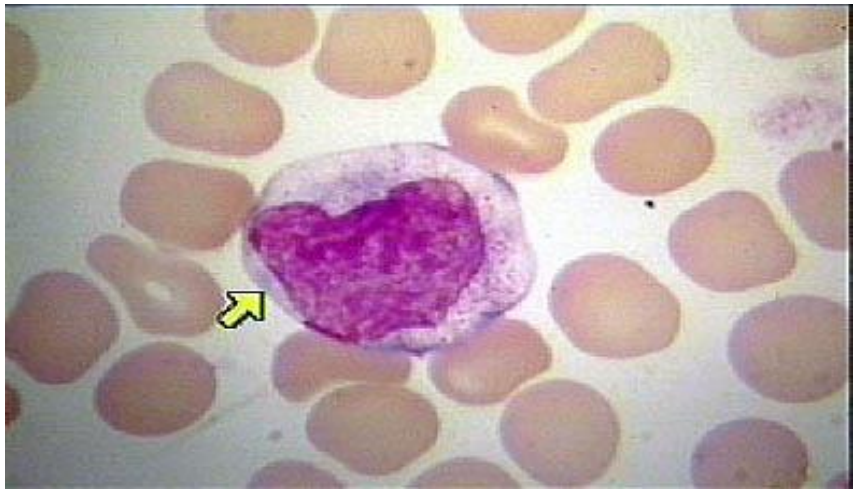
Cellular changes macrophages

- **Monocytes- histocytes- lipophages- oestoclast- kupffer cell- heart failure cell- melanophores -**



Cellular changes macrophages

- Marked phagocytosis
- 2nd. Line of defense
- Secrete various enzymes and neutrolizing substances
- In the tissue, Movable or fixed
- Fuse together forming epithelioid and or giant cells



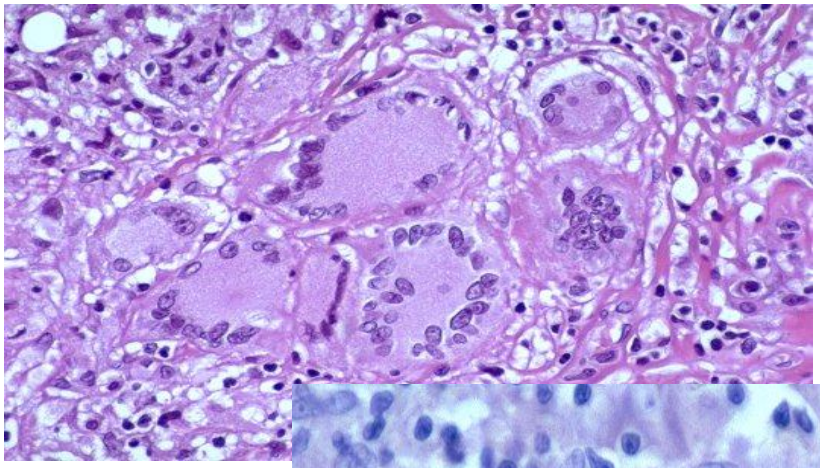
Cellular changes epithelioid cells

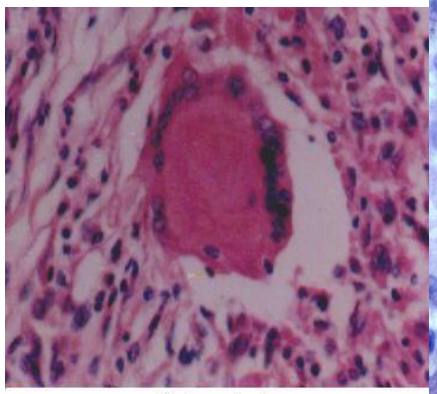
- Large polyhedral cells having foamy cytoplasms and vesicular nuclei
- Found in herds (aggregates)
- Developed from macrophages
- Found in granalomatous dis.
- Fuse together forming giant cells

Paratuberculosis (John's disease)
Intestinal mucosa infiltrated by epithelioid cells (shown at the lower left corner) and lymphocytes in a diffuse manner leading to thickening of the wall

Cellular changes
Giant cells

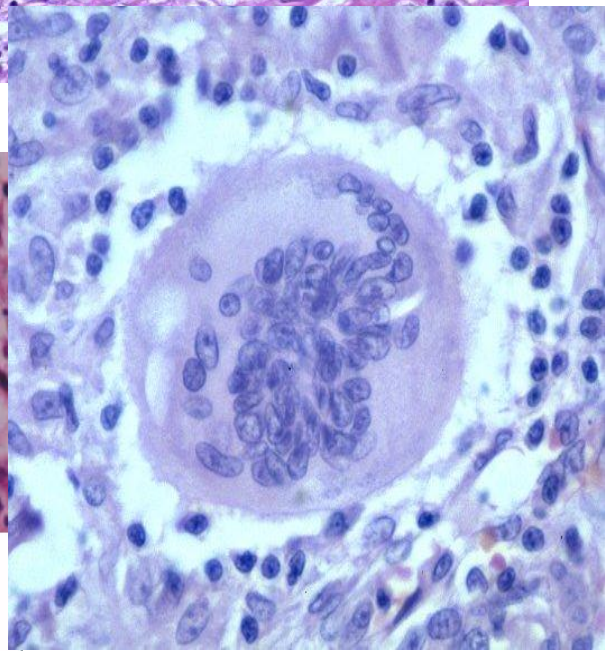
- Largest phagocytic cells
- 3 types ; Langerhan’s, foreign body, and tumor giant cells
- Foamy cytoplasm
- 2-100 or more nuclei
- Found in granulomatous dis.





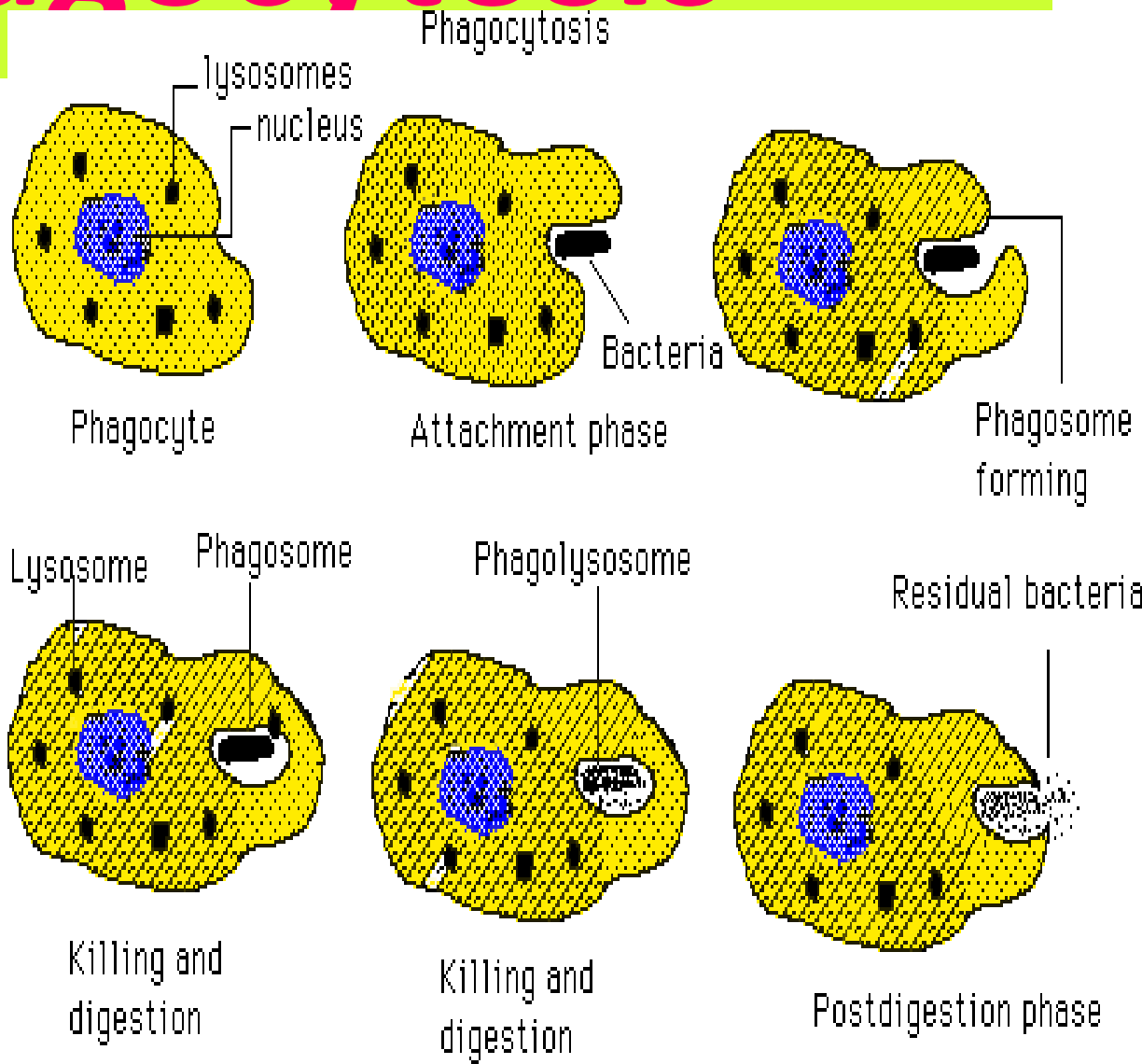
Tuberculosis

multinucleated Langhan's giant cell



Phagocytosis

- Macrophages
- Neutrophils
- Platelets
- Epithelioid cells
- Giant cells
-



Chemical mediators

- **Are chemical substances liberated within injured tissue.**
  - **Increase vascular permeability.**
  - **Play an important role in escape of leucocytes from blood vessels.**

Chemical mediators of inflammation

Substances that cause Vasodilatation

- **Mast cells** — Histamine, Serotonin, Slow-reacting substance of inflammation
- **Neutrophils** — Cationic protein, Acid and neutral proteases, Prostaglandins
- **Lymphocytes** — Lymphokines
- **Adrenal gland** — Adrenaline
- **Plasma** — Bradykinin
- **Bacteria** — Bacterial toxins

Chemotaxis

- **It is the directional movement of an inflammatory cell in response to a chemical substances (called chemotactic factors**
- **Chemotactic substances :**
  - **Bacteria**
  - **Dead tissue**
  - **Ag-ab reaction**
  - **Lymphokine (leukotriene B4)**

Nomenclature

- The nomenclatures of inflammatory lesion are usually indicated by the suffix 'itis'.

- Meninges
- Brain
- Lung
- Pleura
- Pericardium
- Oesophagus
- Stomach
- ,Liver
- Gallbladder
- Pancreas
- Urinary bladder
- Bone
- Subcutaneous tissues
- Joints
- Arteries

- Meningitis
- Encephalitis
- Pneumonia
- Pleurisy(pleuritis)
- Pericarditis
- Oesophagitis
- Gastritis
- Hepatitis
- Cholecystitis
- Pancreatitis
- Cystitis
- Osteomyelitis
- Cellulitis
- Arthritis
- Arteritis

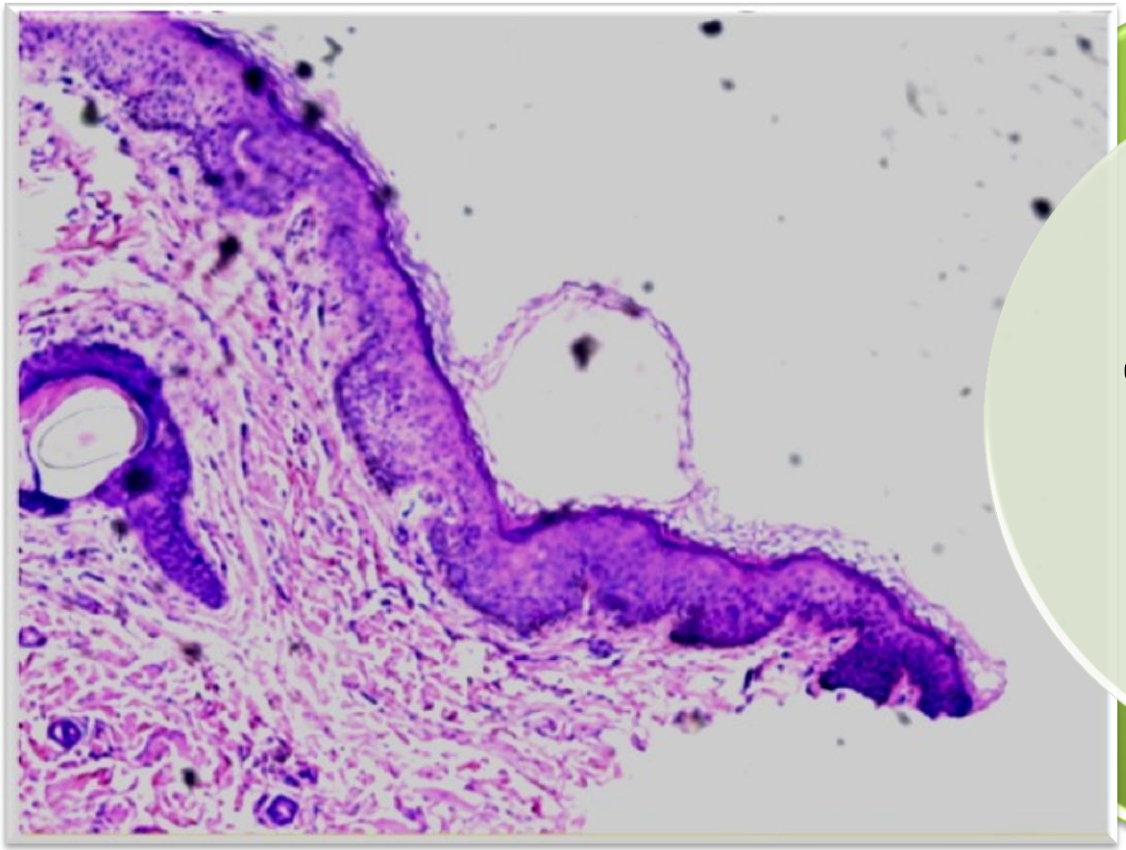
Classification of inflammation

- **Time**:
  - Peracute
  - Acute
  - Subacute
  - Chronic

- **Exudate:**
  - Serous
  - Catarrhal
  - Suppurative
  - Fibrinous
  - Hemorrhagic
  - Lymphocytic
  - Granulomatous

Serous inflammation

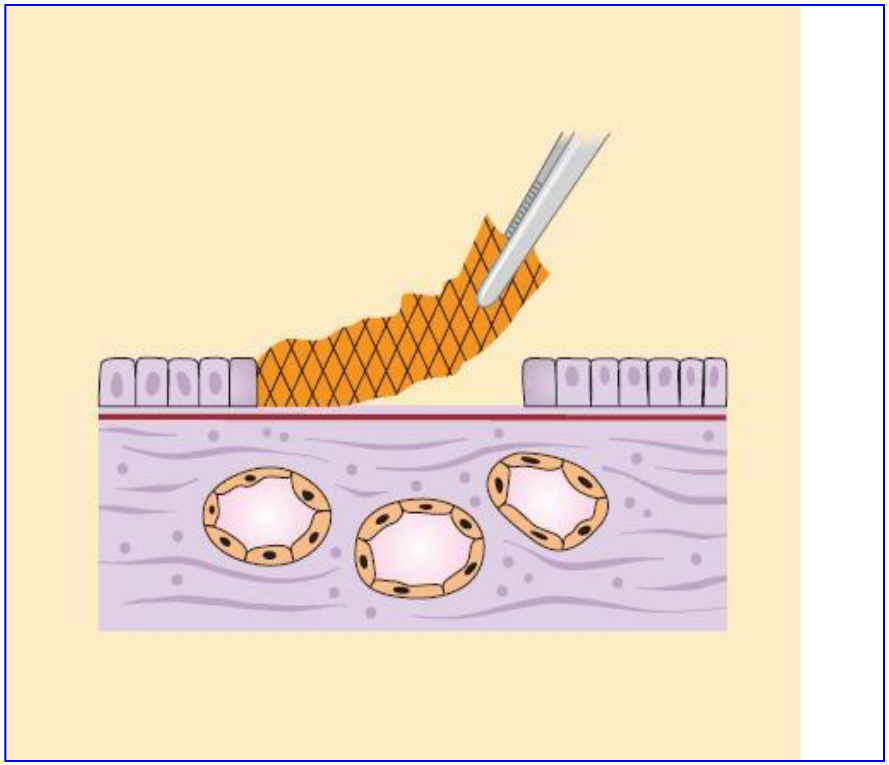
- Serous
- Mild degeneration
- Congestion
- finely granular eosinophilic material



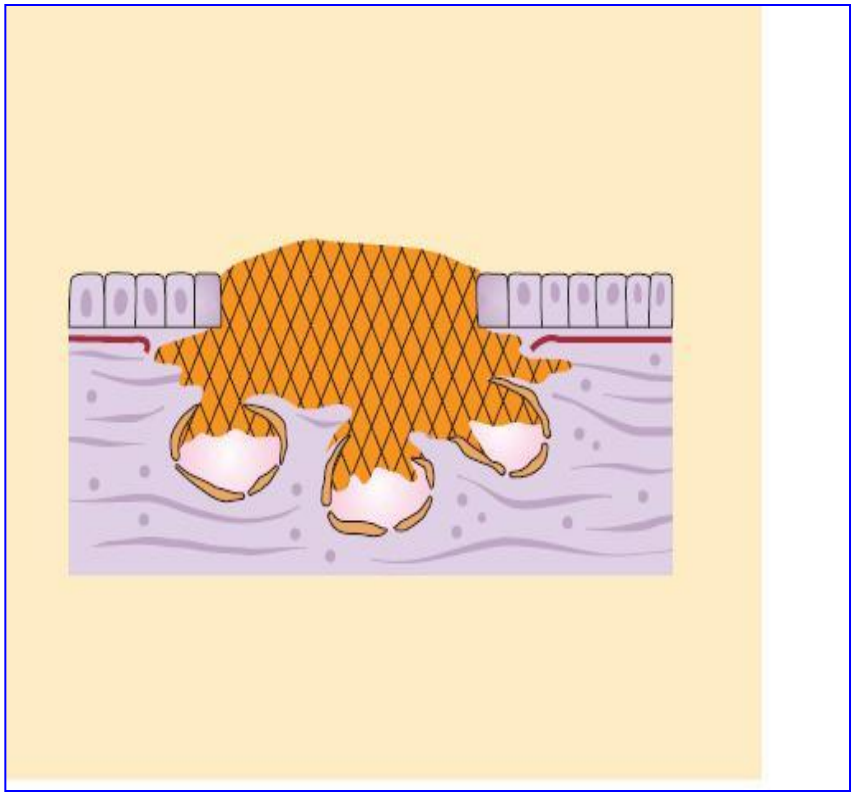
Serous infla.

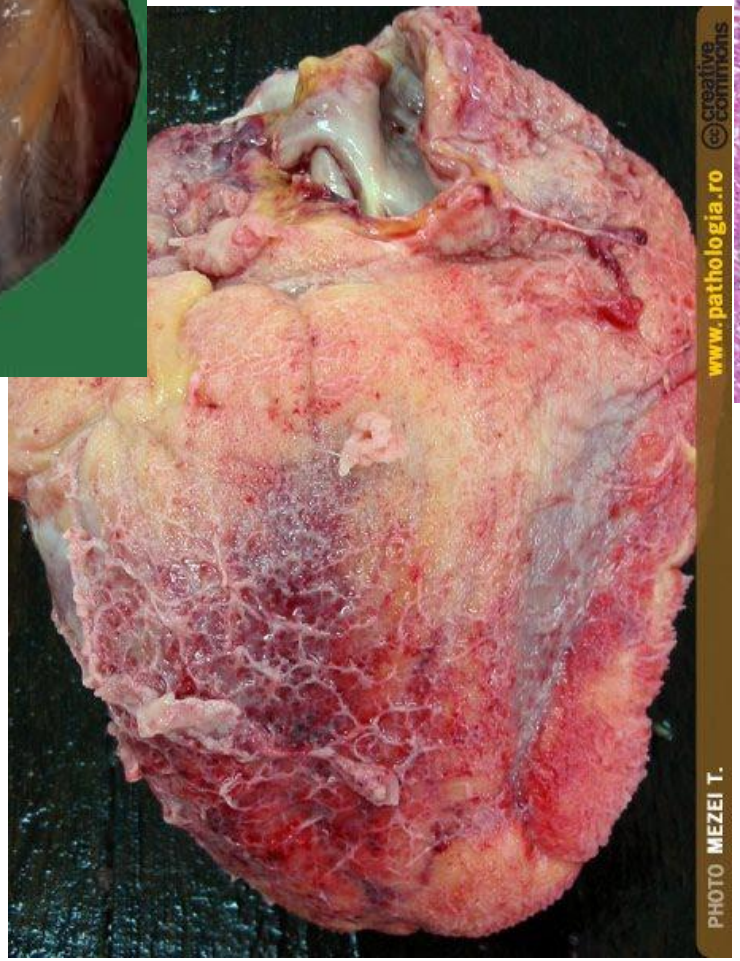
Fibrinous inflam.

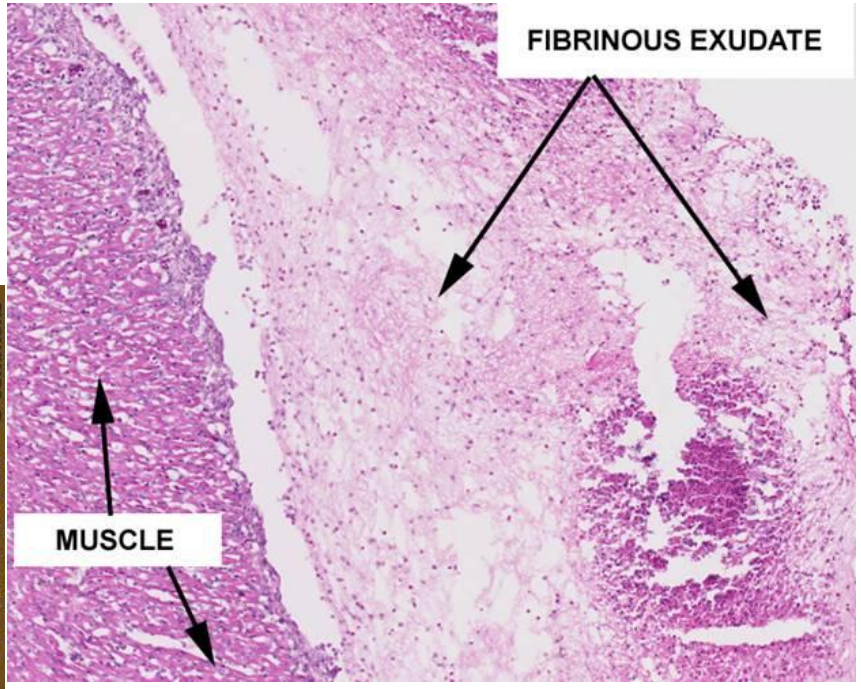
Pseudomembranous



Diphtheritic

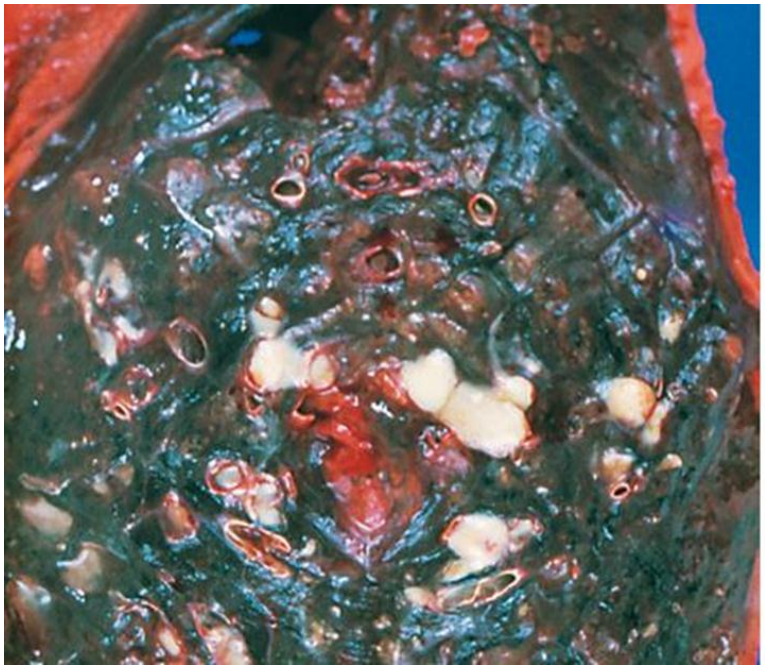


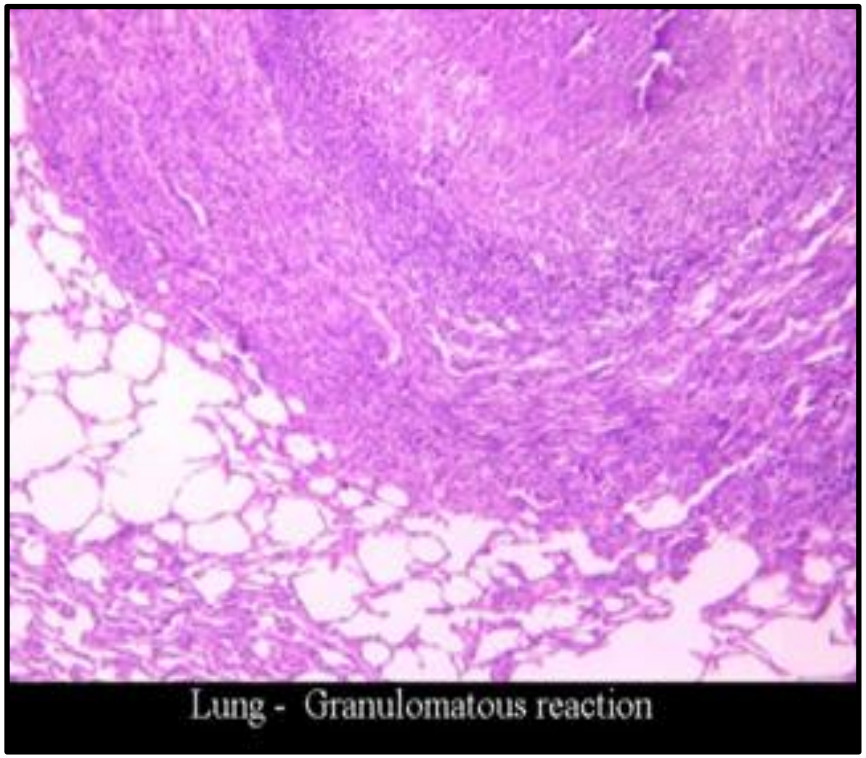

www.pathologia.ro
creative commons
PHOTO MEZEI T.


FIBRINOUS EXUDATE
MUSCLE

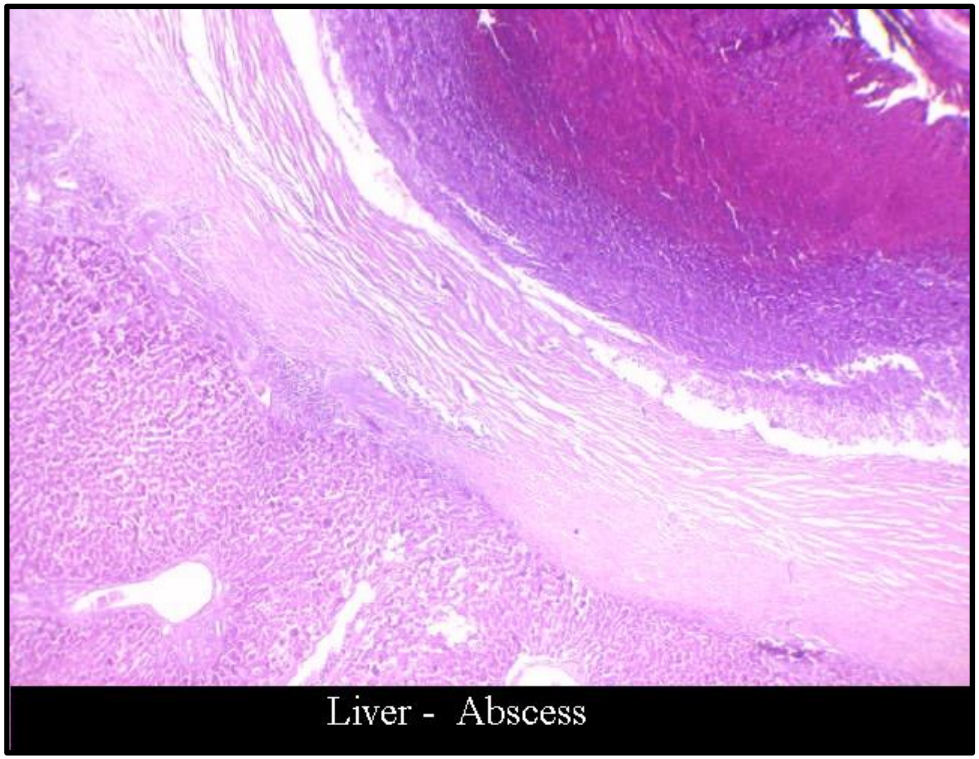
Suppurative inflammation

- **Forms:**
  - **Microabscess (microscopic)**
  - **Abscess (old –recent)**
  - **Pustule :supp. Inf. Of epidermis**
  - **Fruncle: supp. Inf. Of hair follicles**
  - **Carbuncle : focal supp. Inf. Of subcutaneous &sebaceous glands**
  - **Cellulitis : diffuse supp. Inf. Of subcutaneous**
  - **Empyaemi : accumulation of purulent exudate in body cavities**
  - **Pyorrhea: supp. Inf. Of gum**



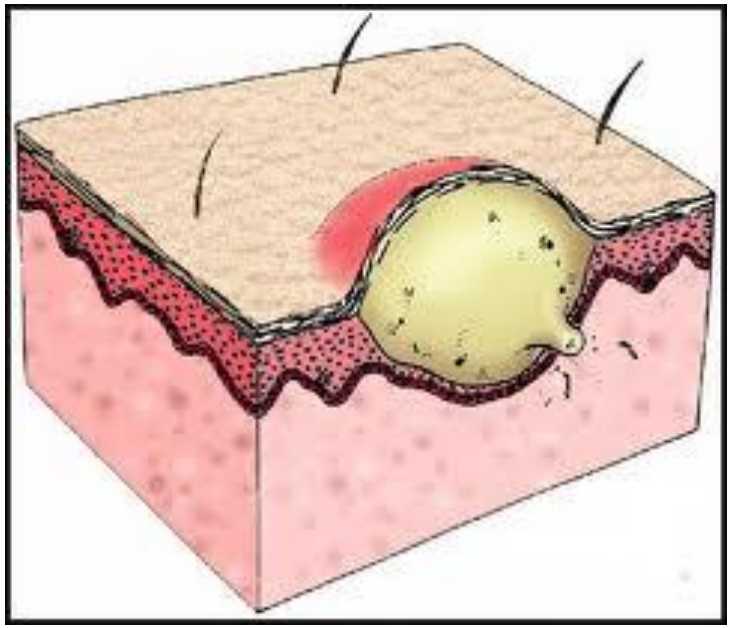


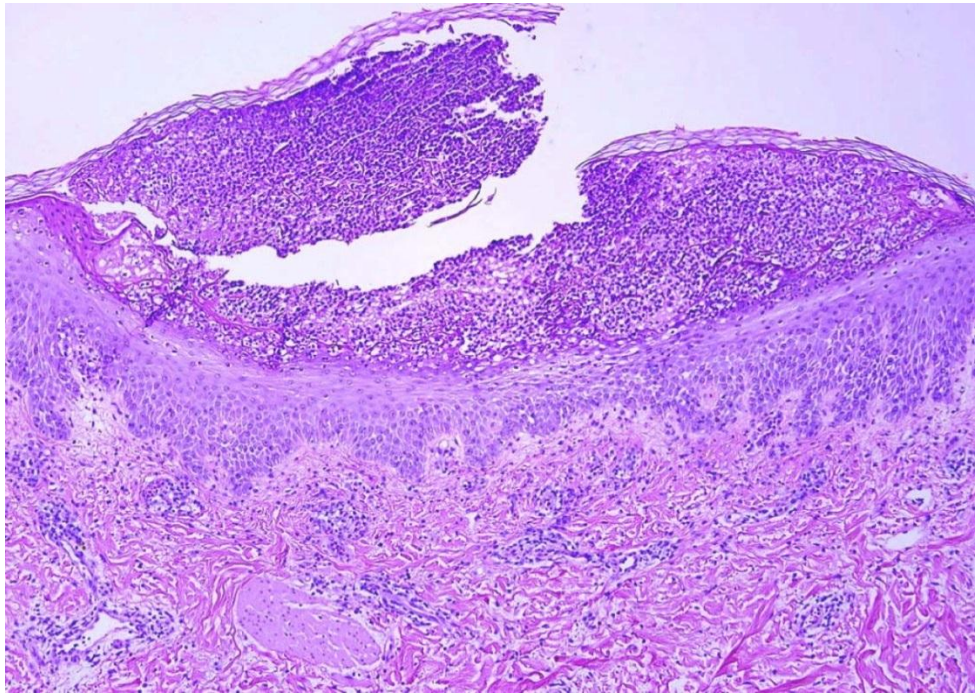
Lung - Granulomatous reaction



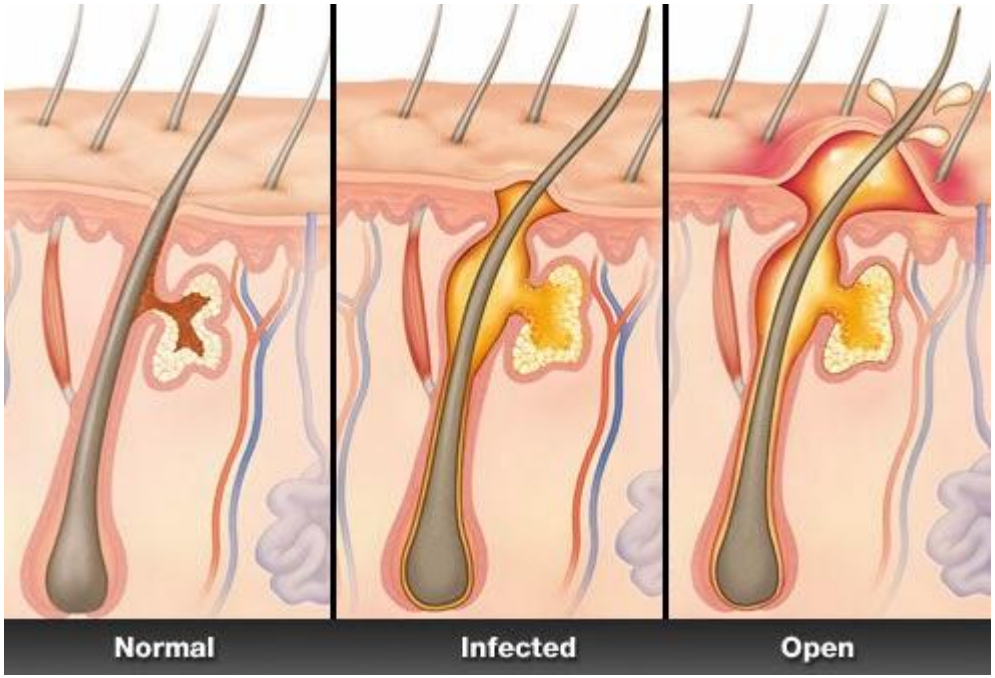
Liver - Abscess

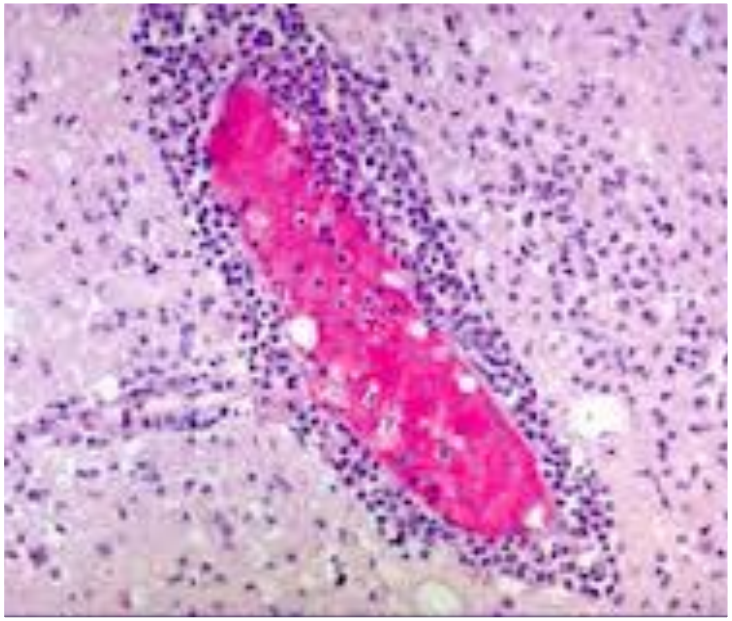
Pustule



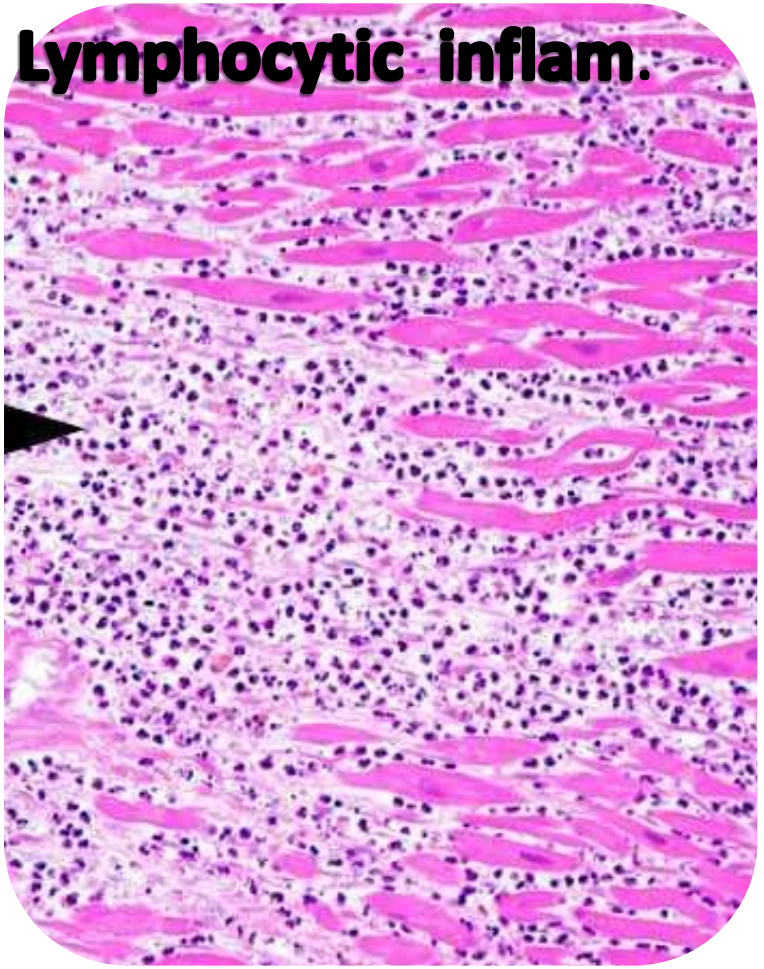


Furuncle

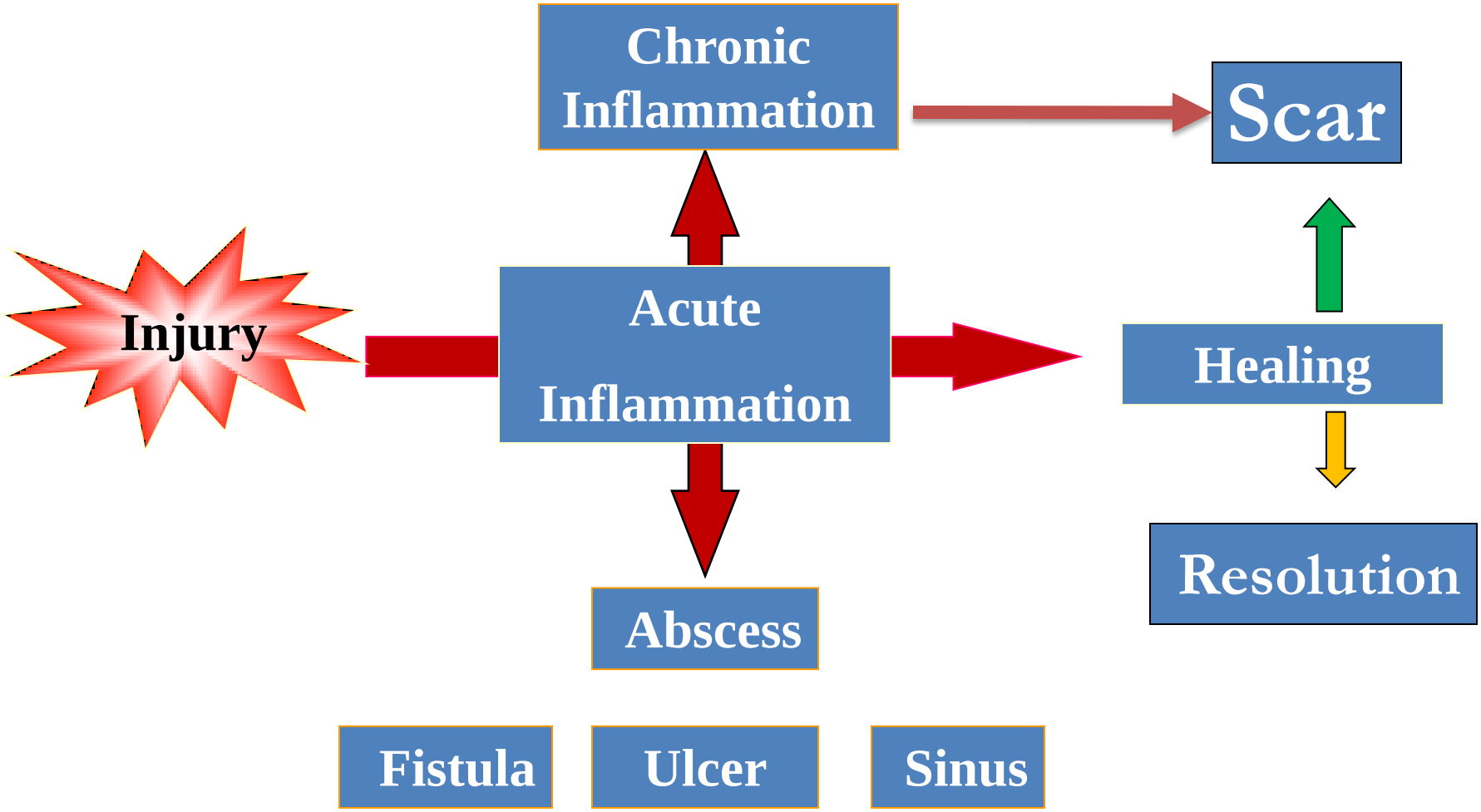




Perivascular cuffing



Inflammation Outcome



Chronic inflammation

- **Host response to an inciting stimulus that goes on for weeks or months**

Characteristics:

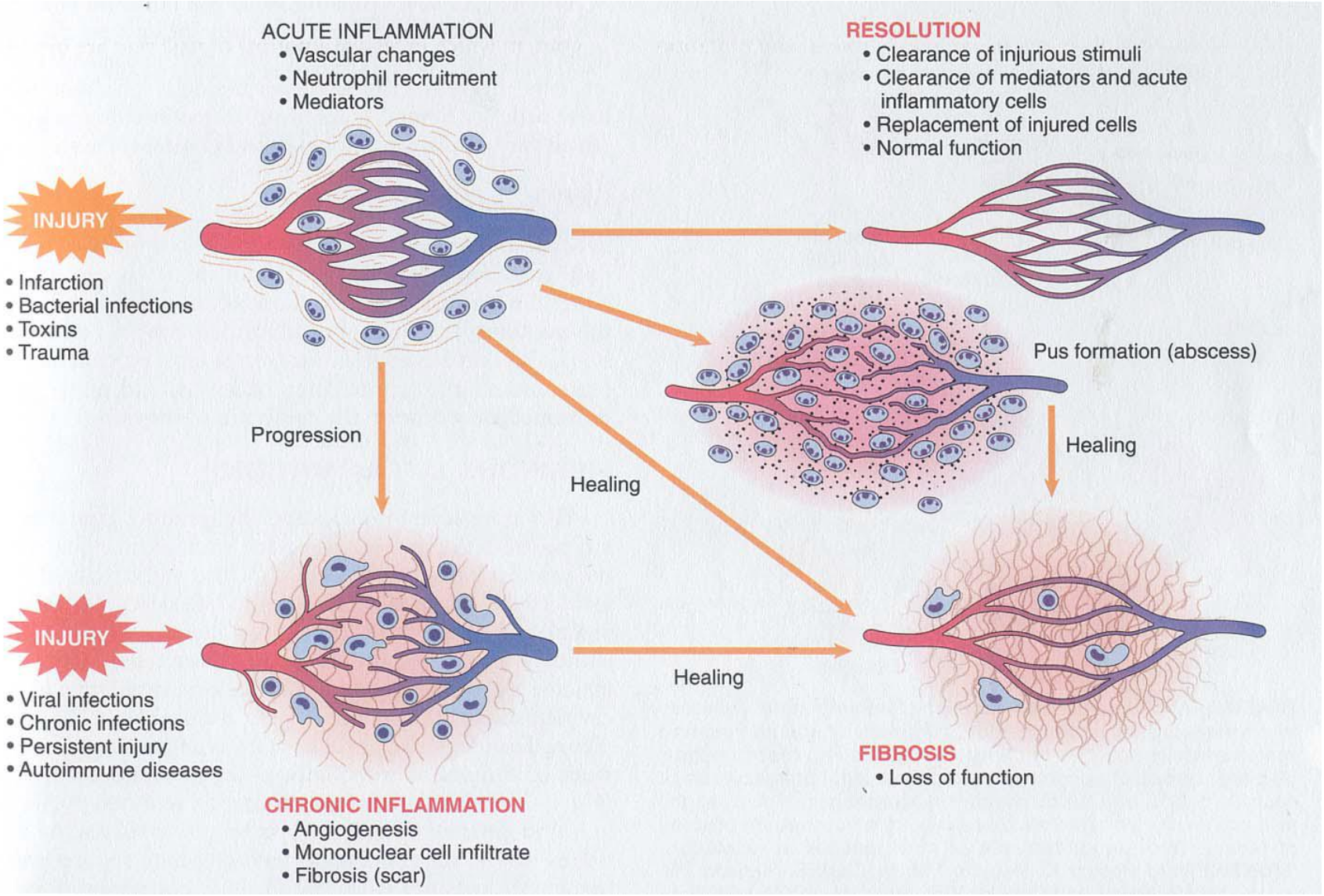
- **Not usually red or hot (unlike acute inflammation)**
- **Do not "ooze"**
- **Productive or proliferative**
- **Often present in infections with higher order organisms (mycobacteria, fungi, metazoan parasites) and in many autoimmune diseases**

Histologic appearance:

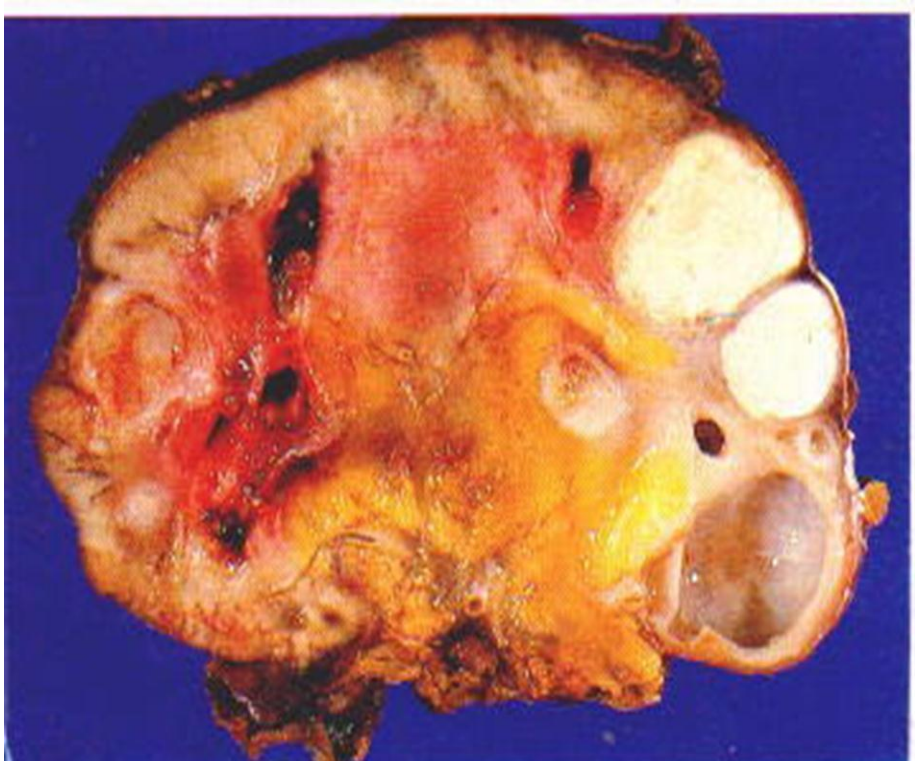
- **Primarily mononuclear cells involved**
- **Fibroblasts and new blood vessels, together called "granulation tissue"**

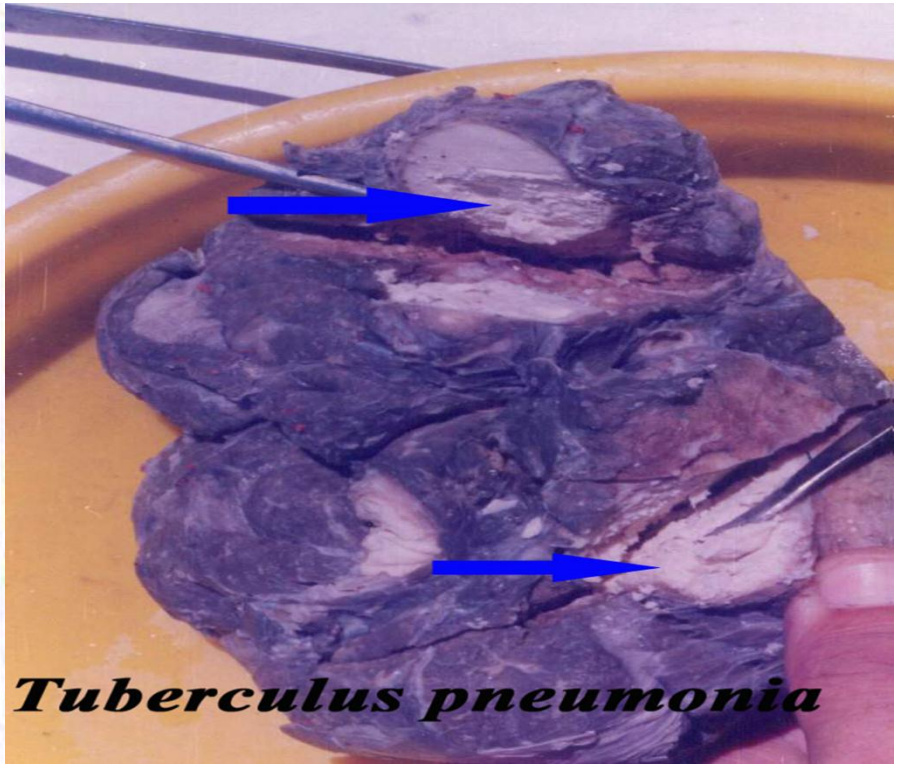
Granulomatous inflammation

- **Is always chronic**
- **Is composed predominantly of(mononuclear cells) mainly lymphocytes and macrophage (lymphohistiocytic)**
- **May have epithelioid cells and multinucleate giant cells (macrophages fuse)**

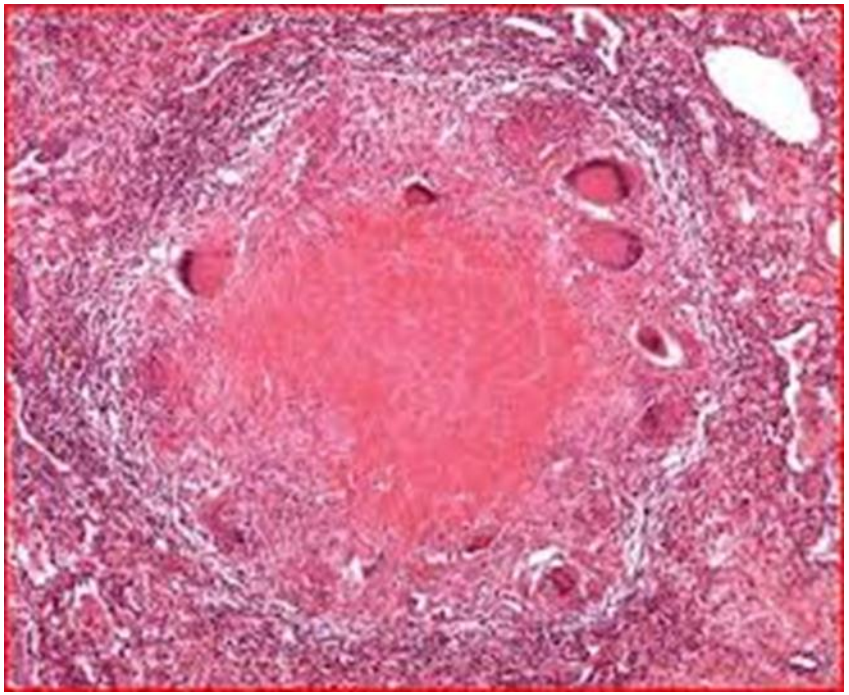

ACUTE INFLAMMATION
• Vascular changes
• Neutrophil recruitment
• Mediators
RESOLUTION
• Clearance of injurious stimuli
• Clearance of mediators and acute inflammatory cells
• Replacement of injured cells
• Normal function
INJURY
• Infarction
• Bacterial infections
• Toxins
• Trauma
Pus formation (abscess)
Progression
Healing
Healing
INJURY
• Viral infections
• Chronic infections
• Persistent injury
• Autoimmune diseases
Healing
FIBROSIS
• Loss of function
CHRONIC INFLAMMATION
• Angiogenesis
• Mononuclear cell infiltrate
• Fibrosis (scar)

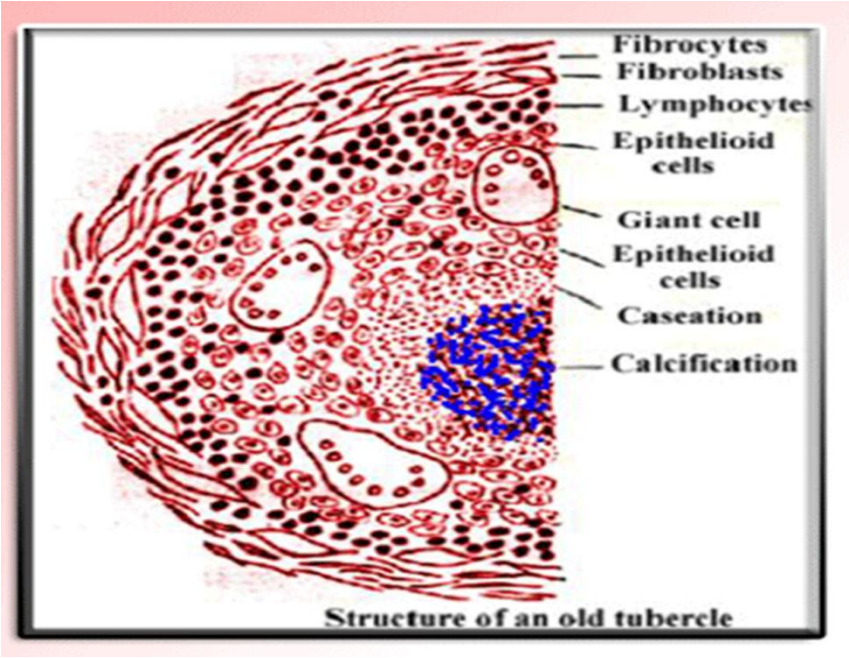
Granulomatous inflammation

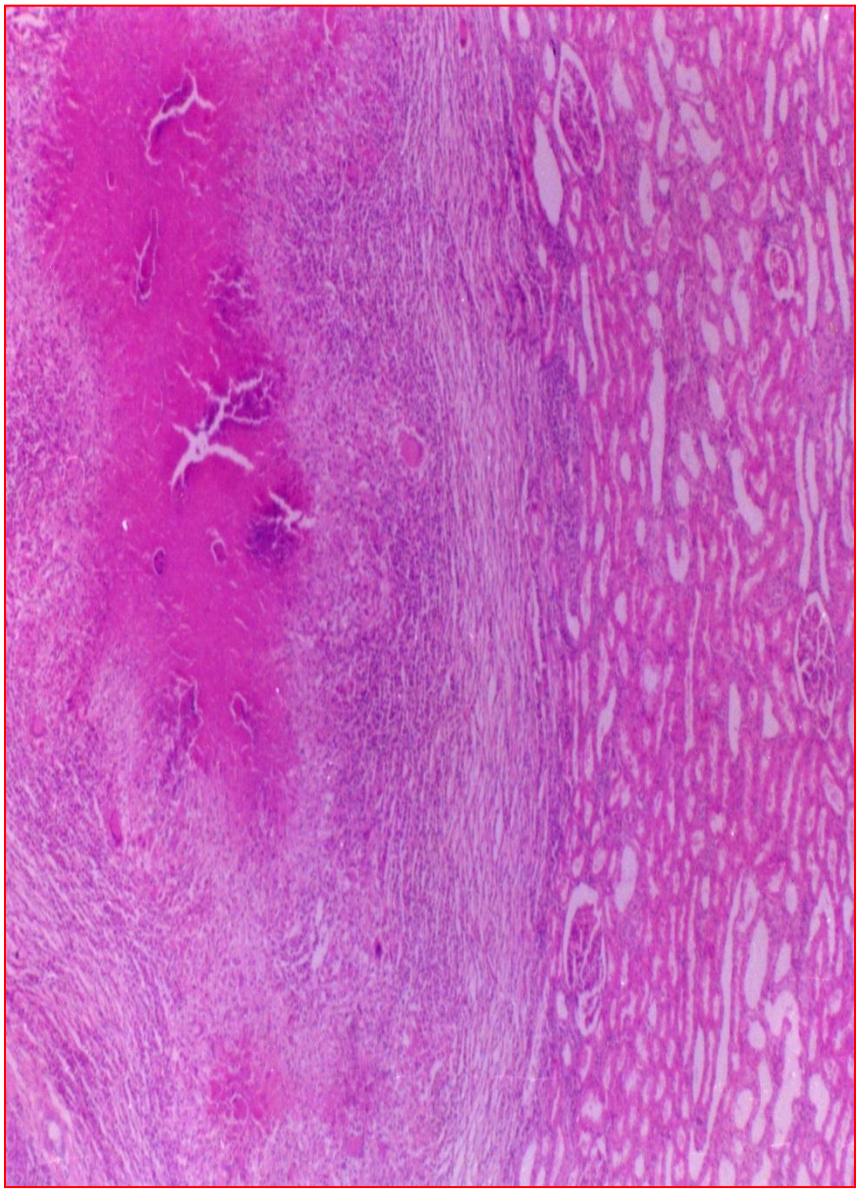




Granulomatous infl.







- شكرا لكم