



SAND2013-1897P

INFLAMMATION



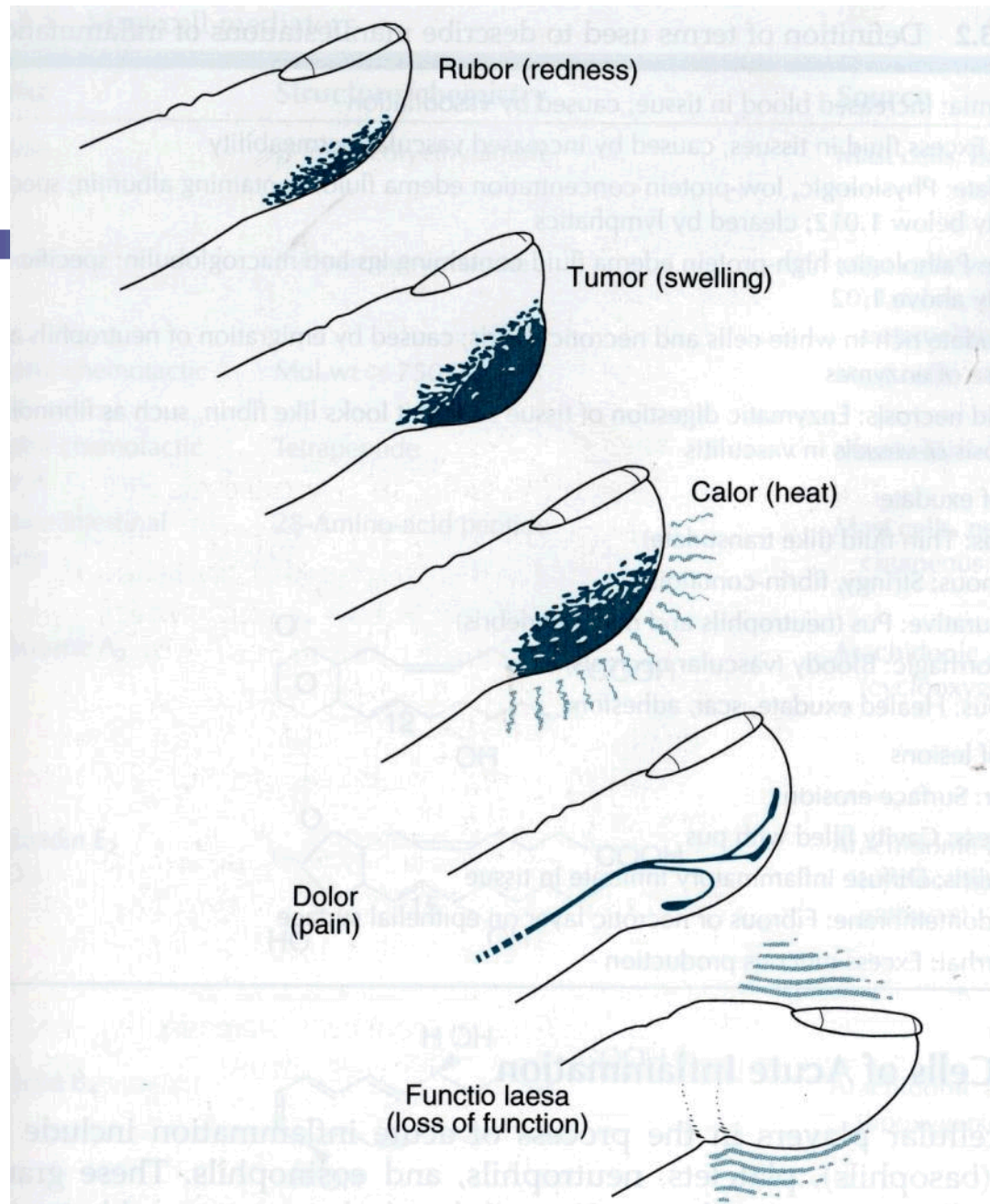
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Inflammation







Causes of inflammation

- **Necrosis**
- **Microorganisms**
- **Physical and chemical agents**
- **Hypersensitivity**



Morphology of Inflammation

- **Duration - acute, chronic**
- **Distribution- focal, diffuse**
- **Exudate- serous, purulent, fibrinous**
- **Tissue name - hepatitis, myocarditis**





Time course of inflammation

Peracute → **acute** → **subacute** → **chronic**

So fast you hardly know what hit you

One day to a few days

In between, a bit of a copout

Weeks to months

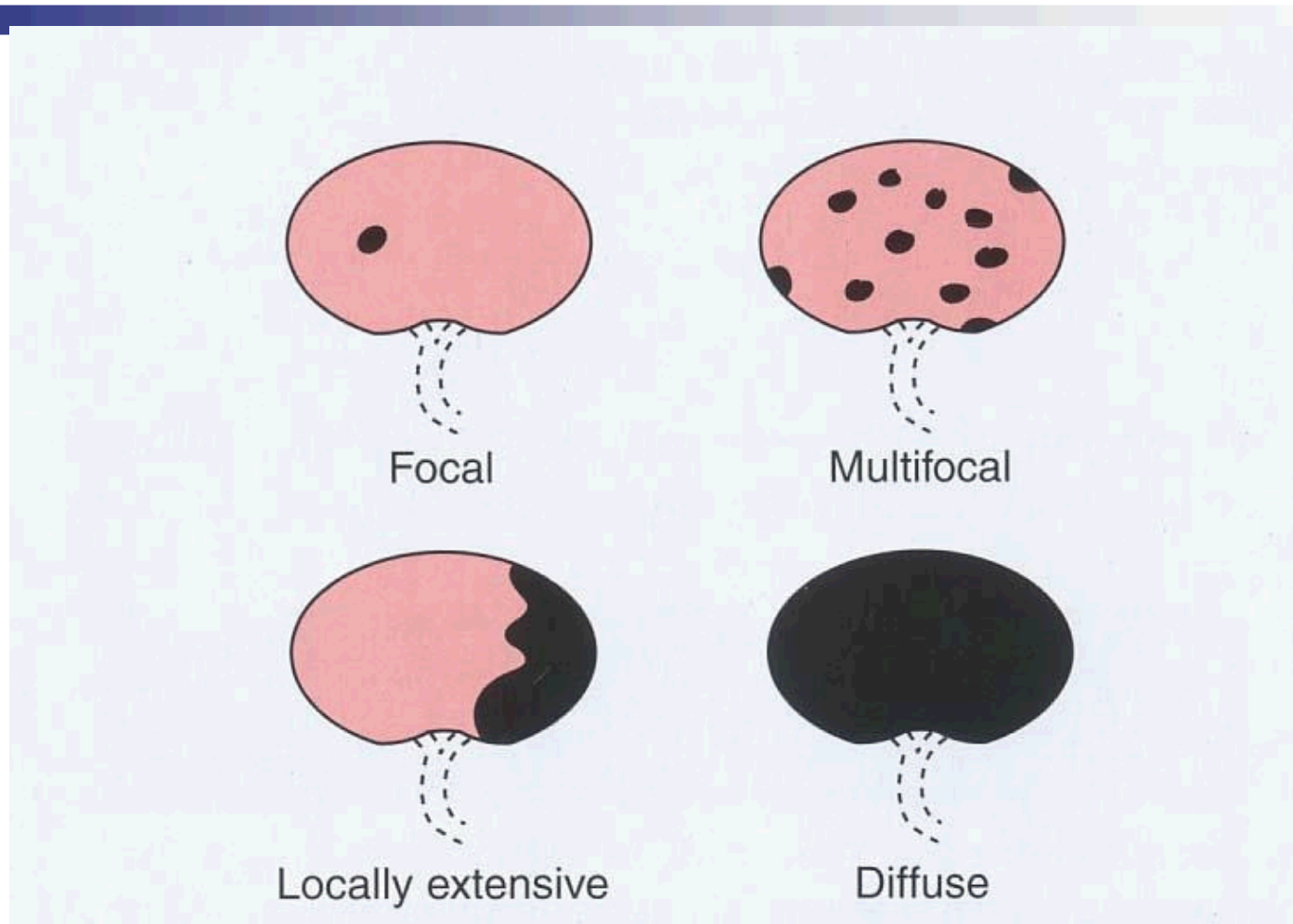


What's the character of the inflammation?

- **Serous**
- **Catarrhal**
- **Fibrinous**
- **Hemorrhagic**
- **Purulent**
- **Necrotizing**
- **Granulomatous**

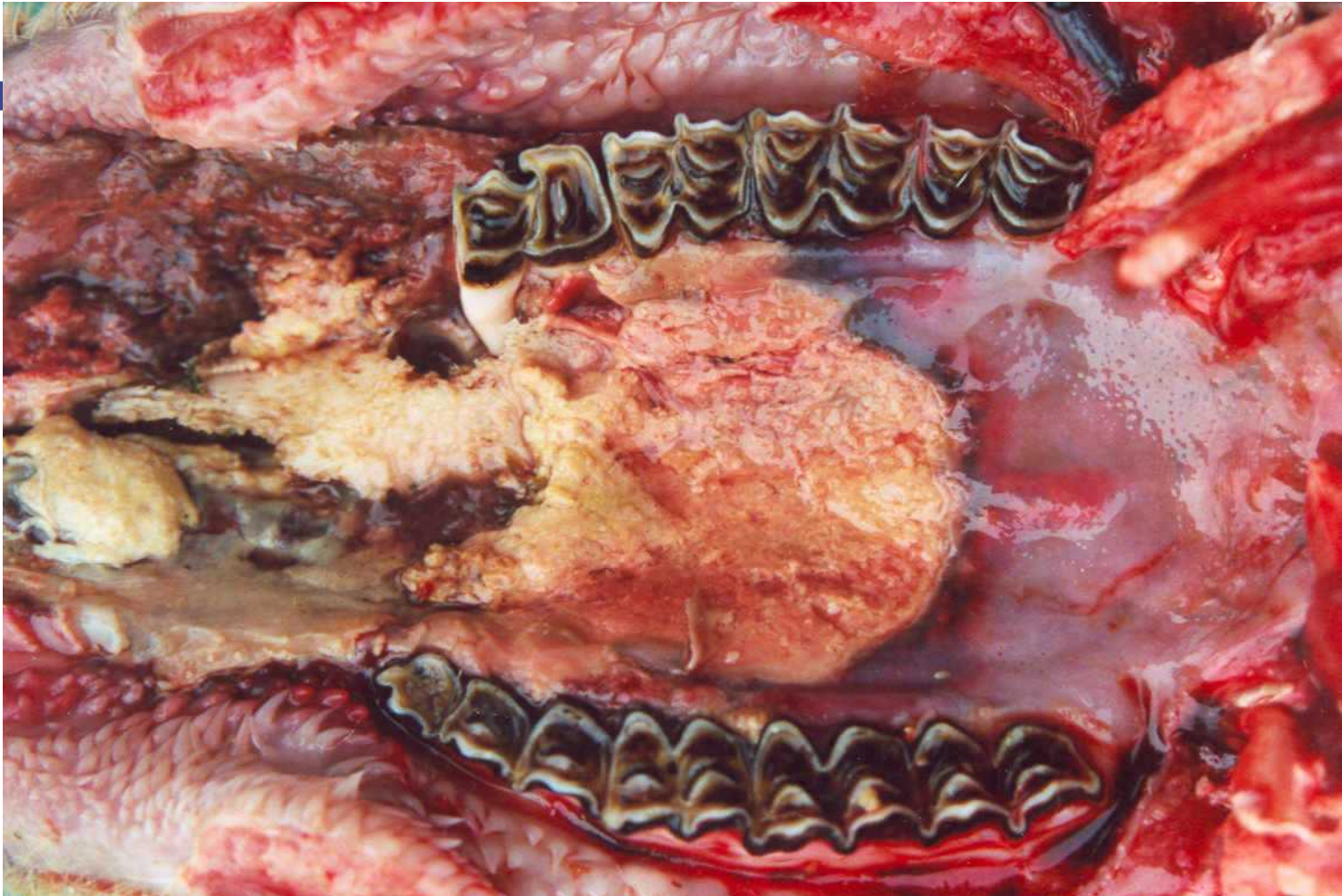


What's the extent of the inflammation?





Horse



Acute focally extensive necrotizing stomatitis

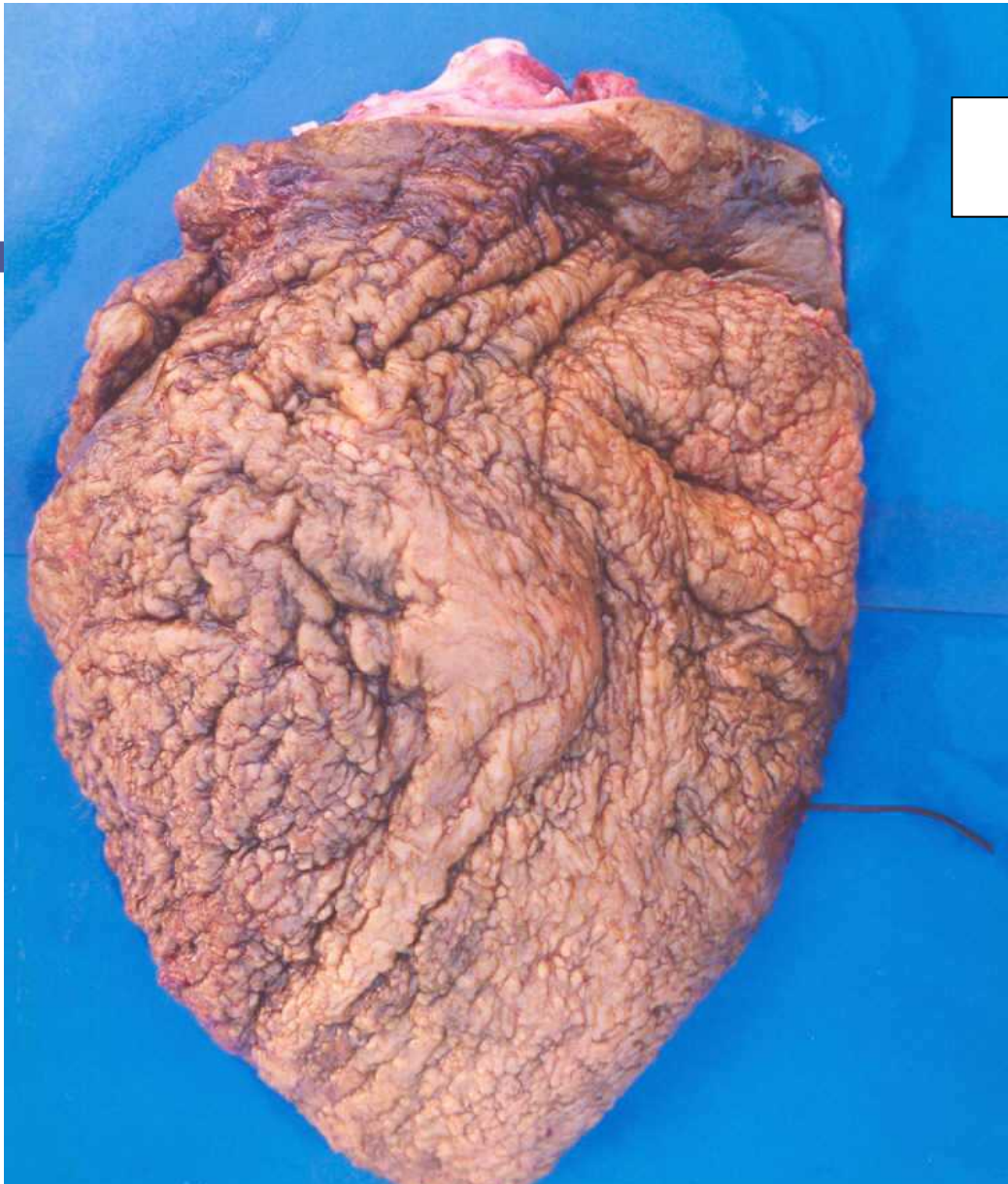


Cow

Focal purulent encephalitis (also cerebral abscess)

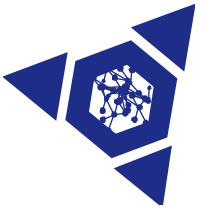


Cow

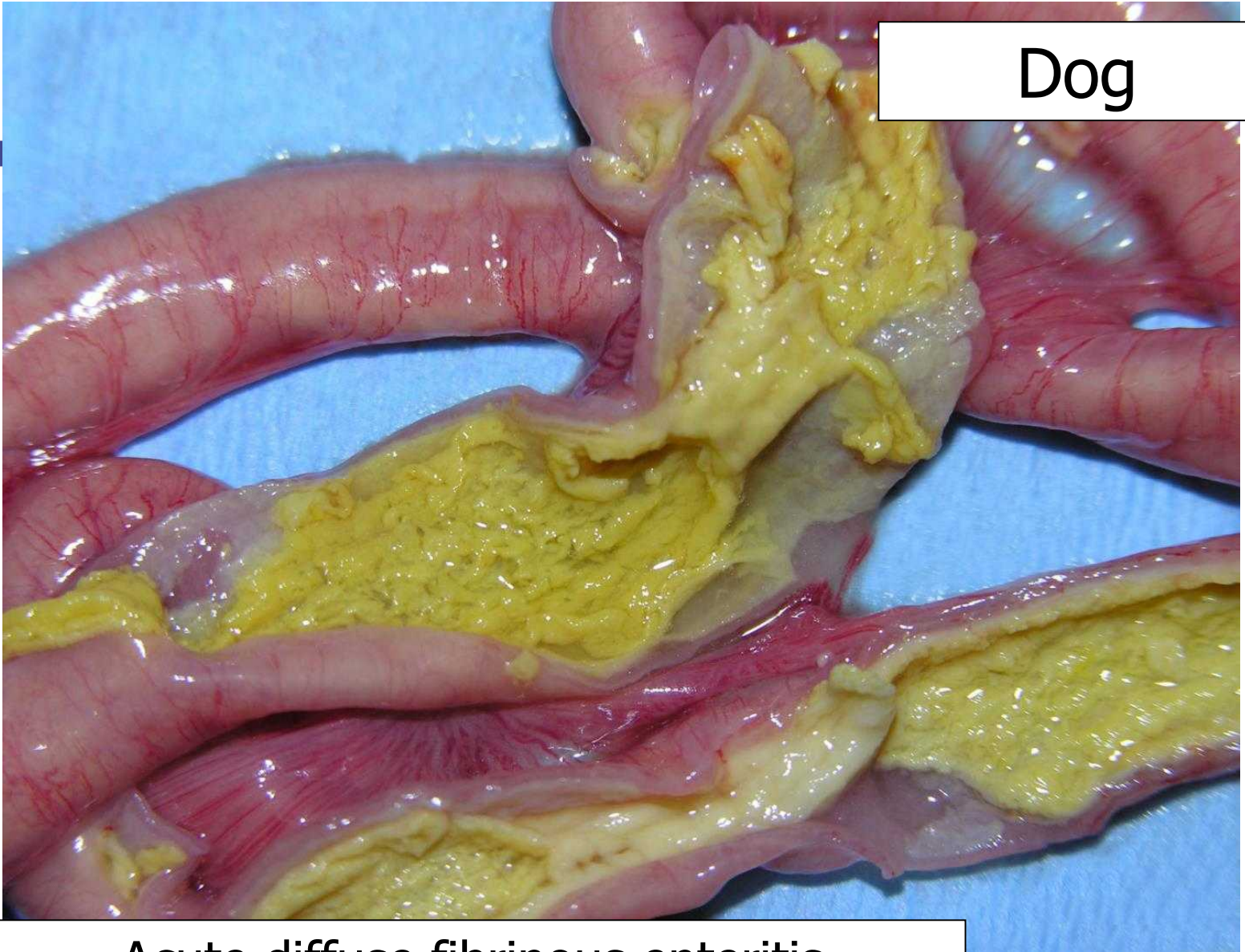


Chronic proliferative pericarditis





Dog

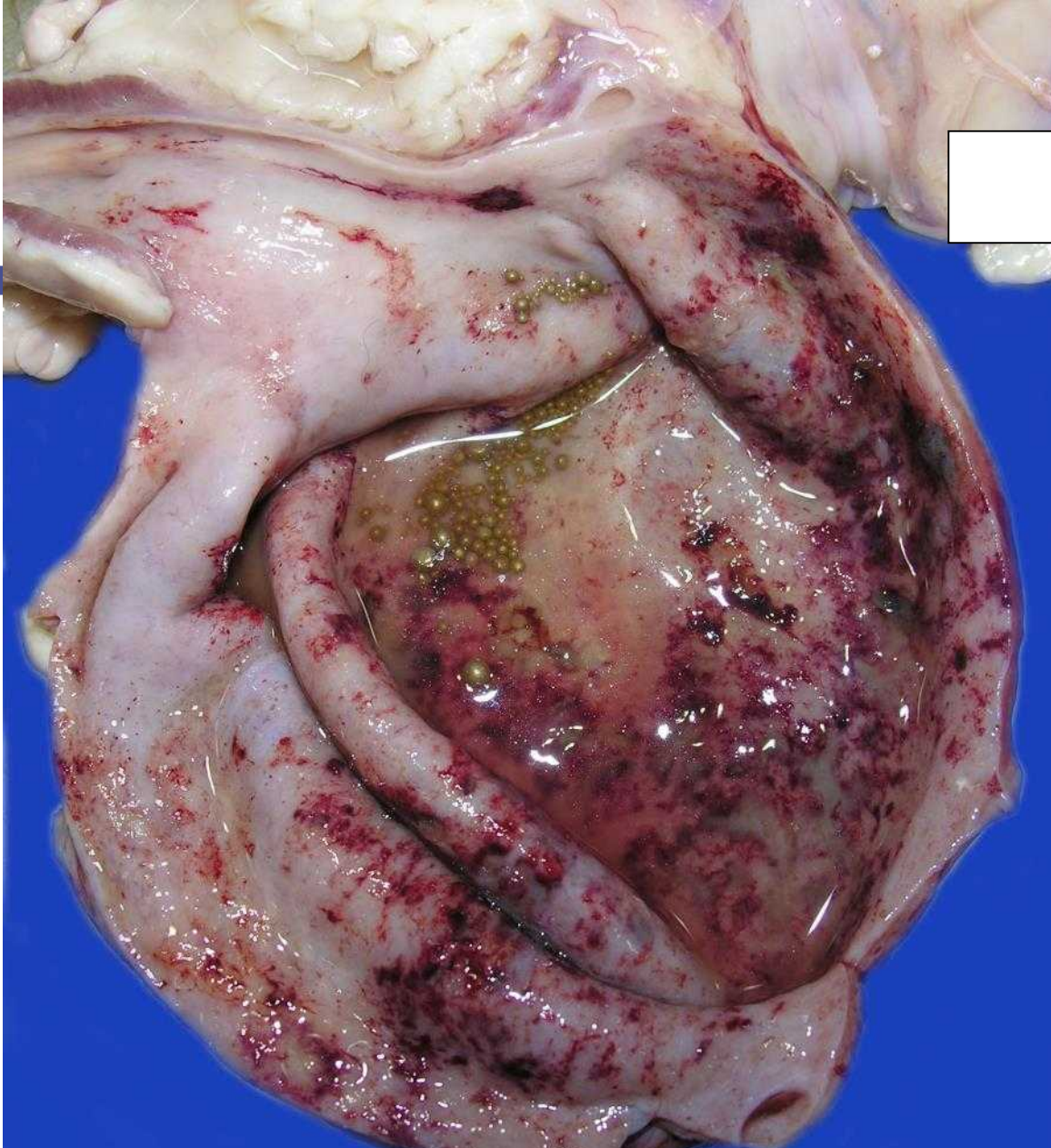


Acute diffuse fibrinous enteritis





Goat



Diffuse hemorrhagic cystitis

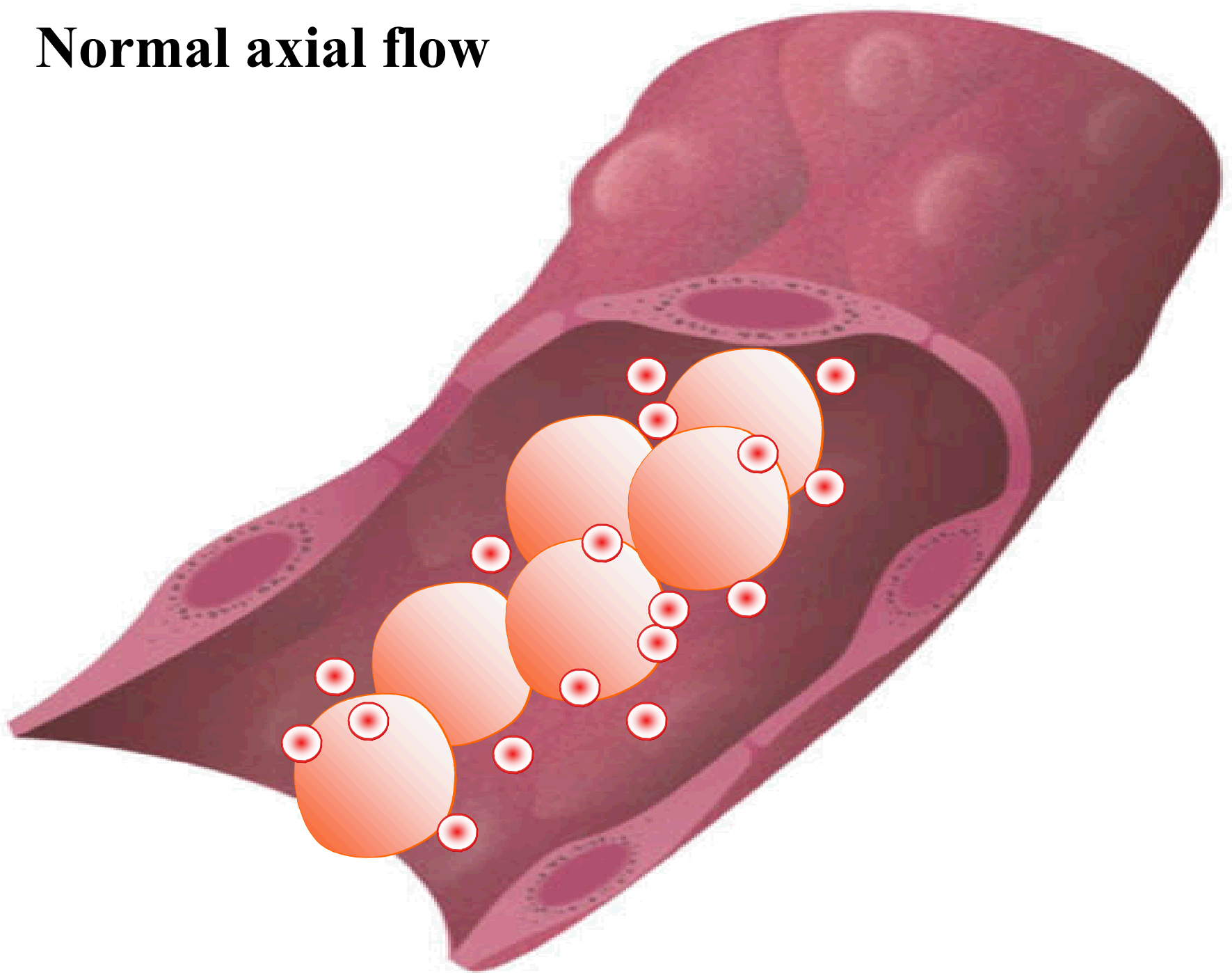




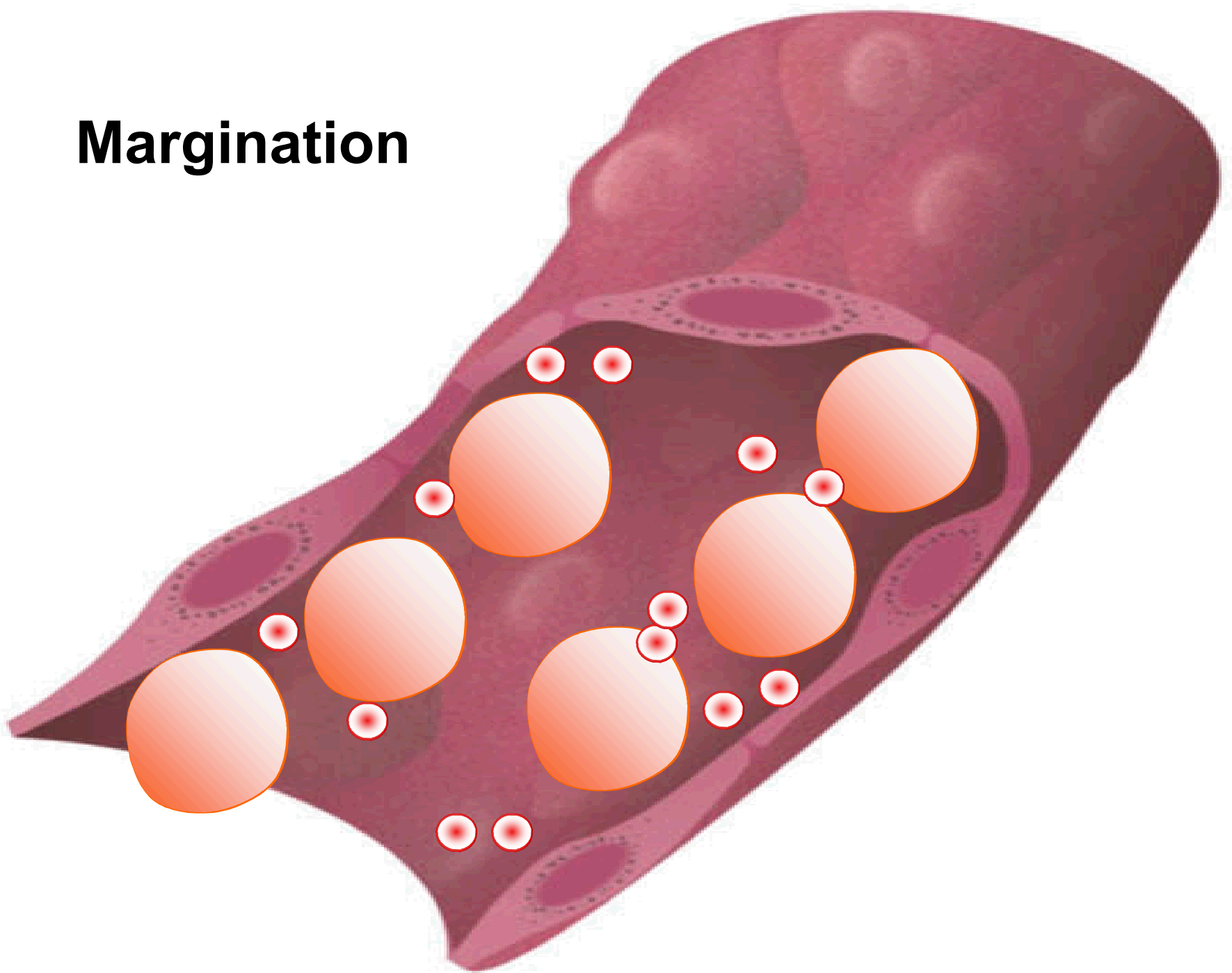
Mechanics of acute inflammation

- **Vascular changes**
 - **Vessels dilate and become leaky**
- **Leukocytes and endothelium “talk” to each other**

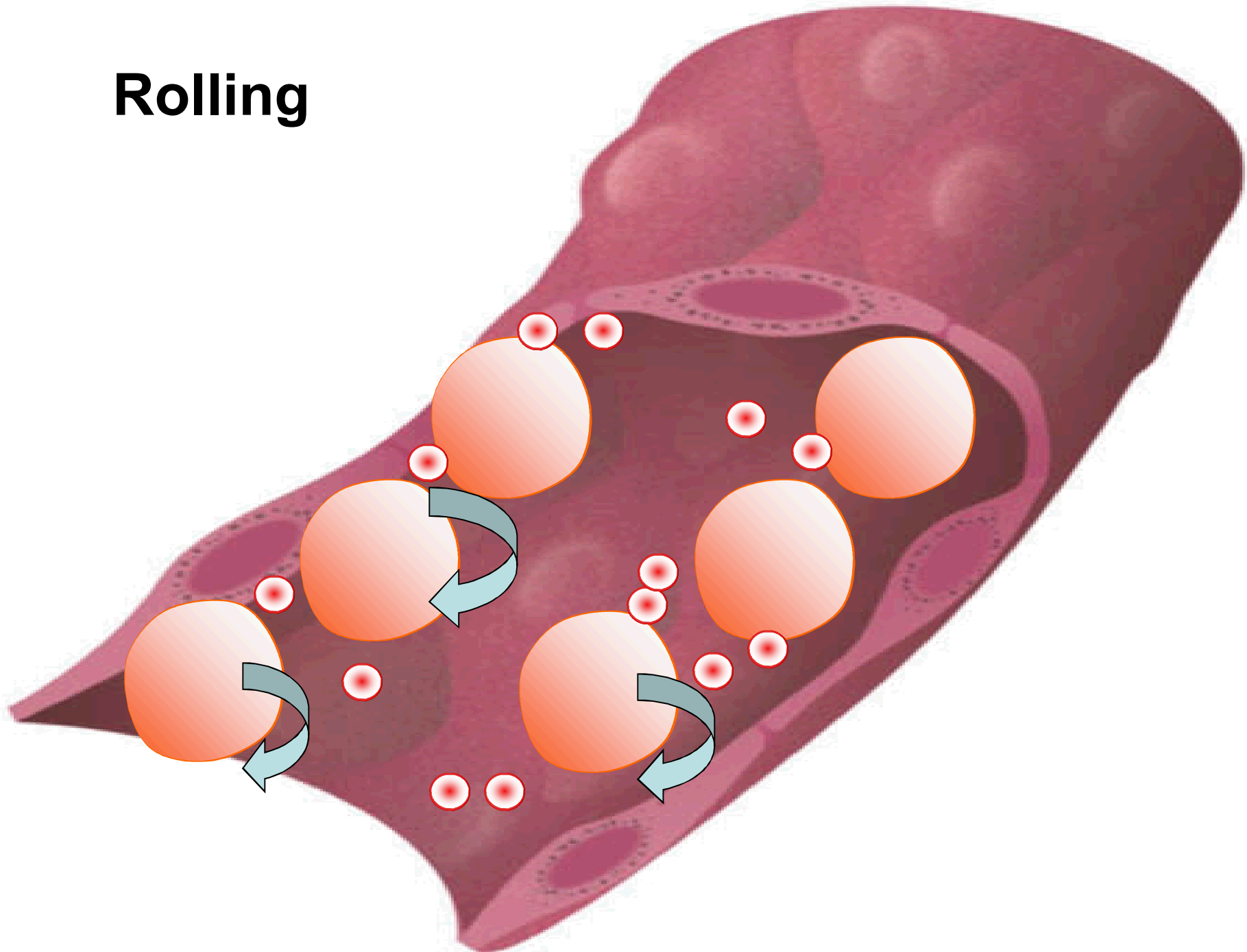
Normal axial flow



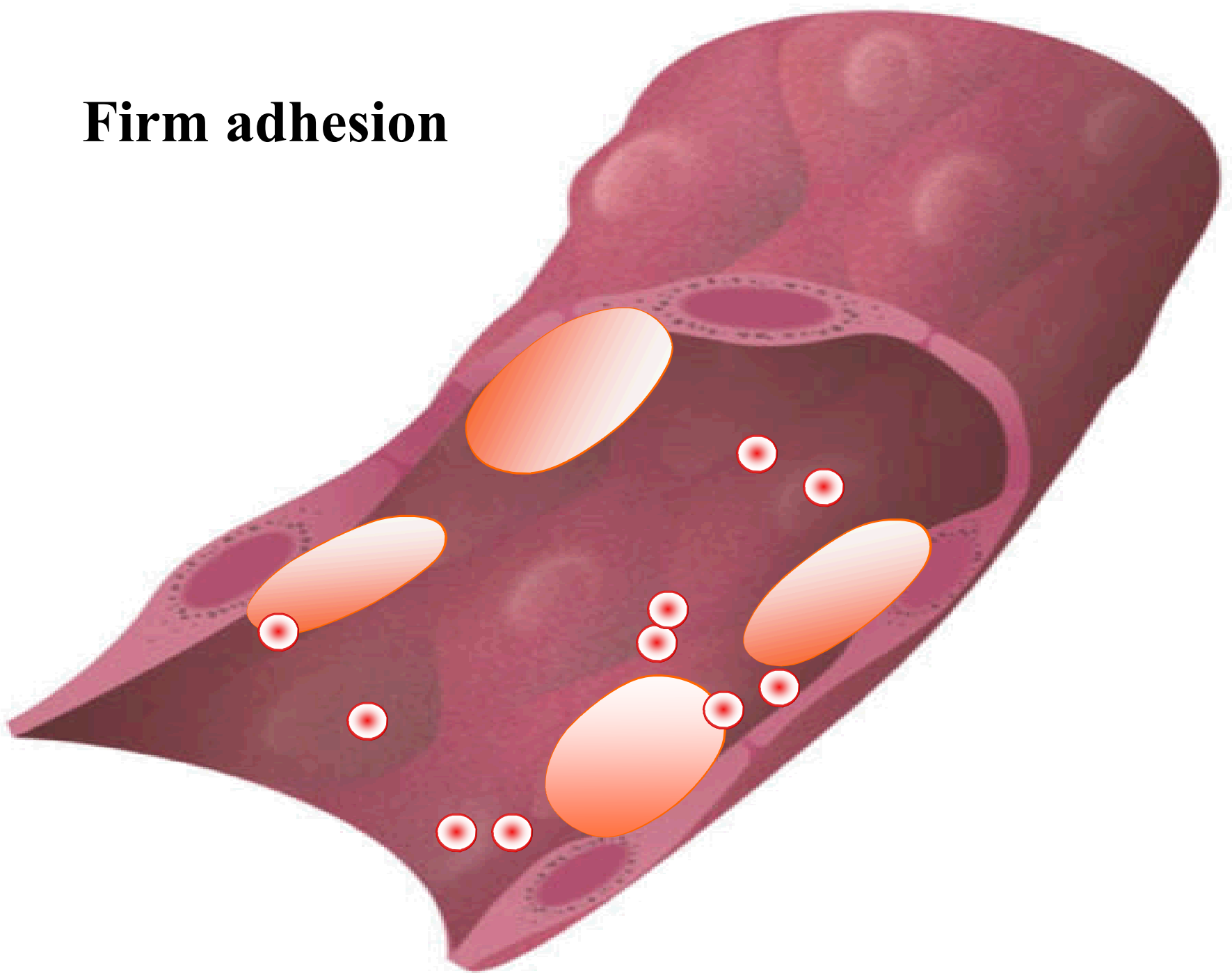
Margination



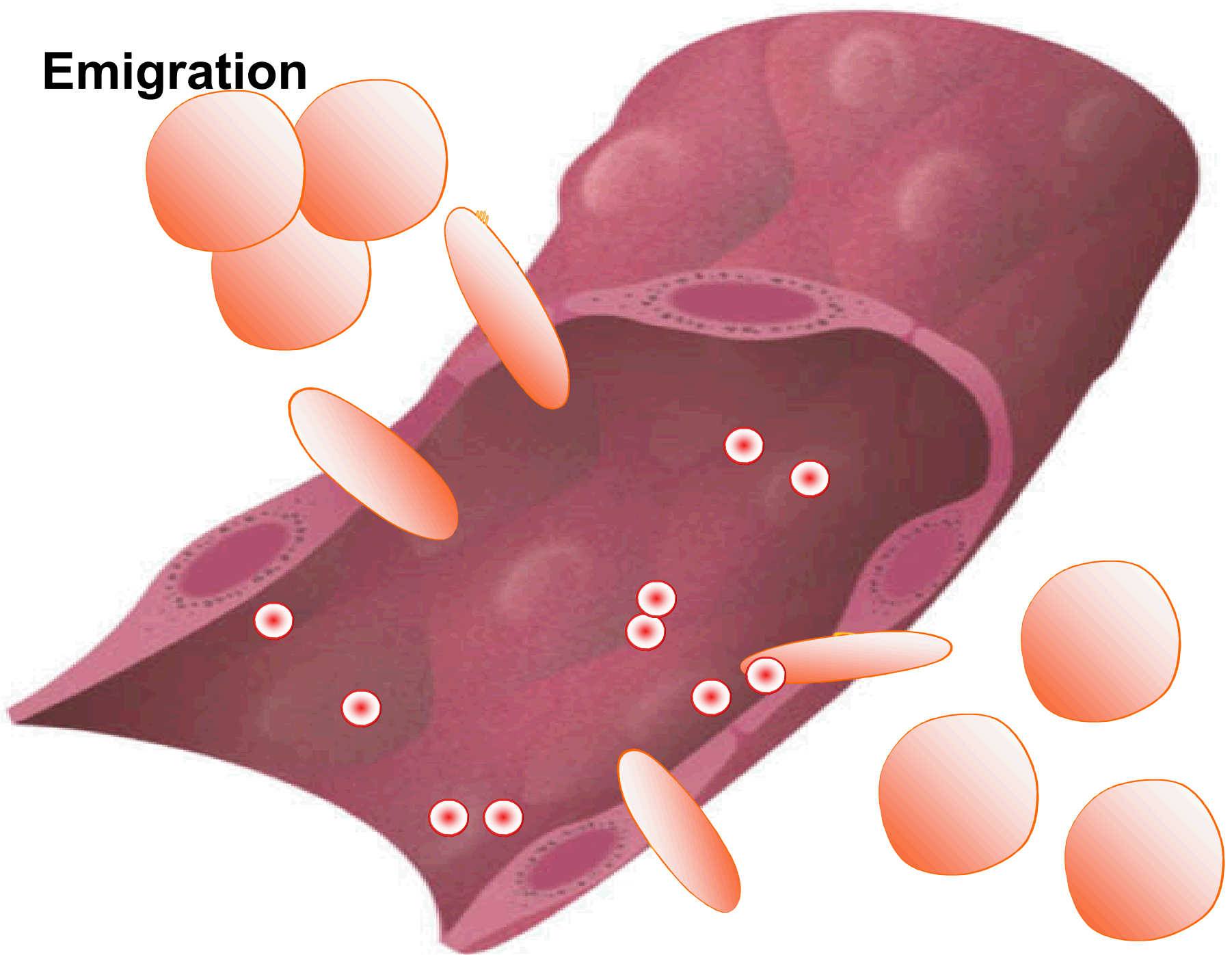
Rolling



Firm adhesion



Emigration





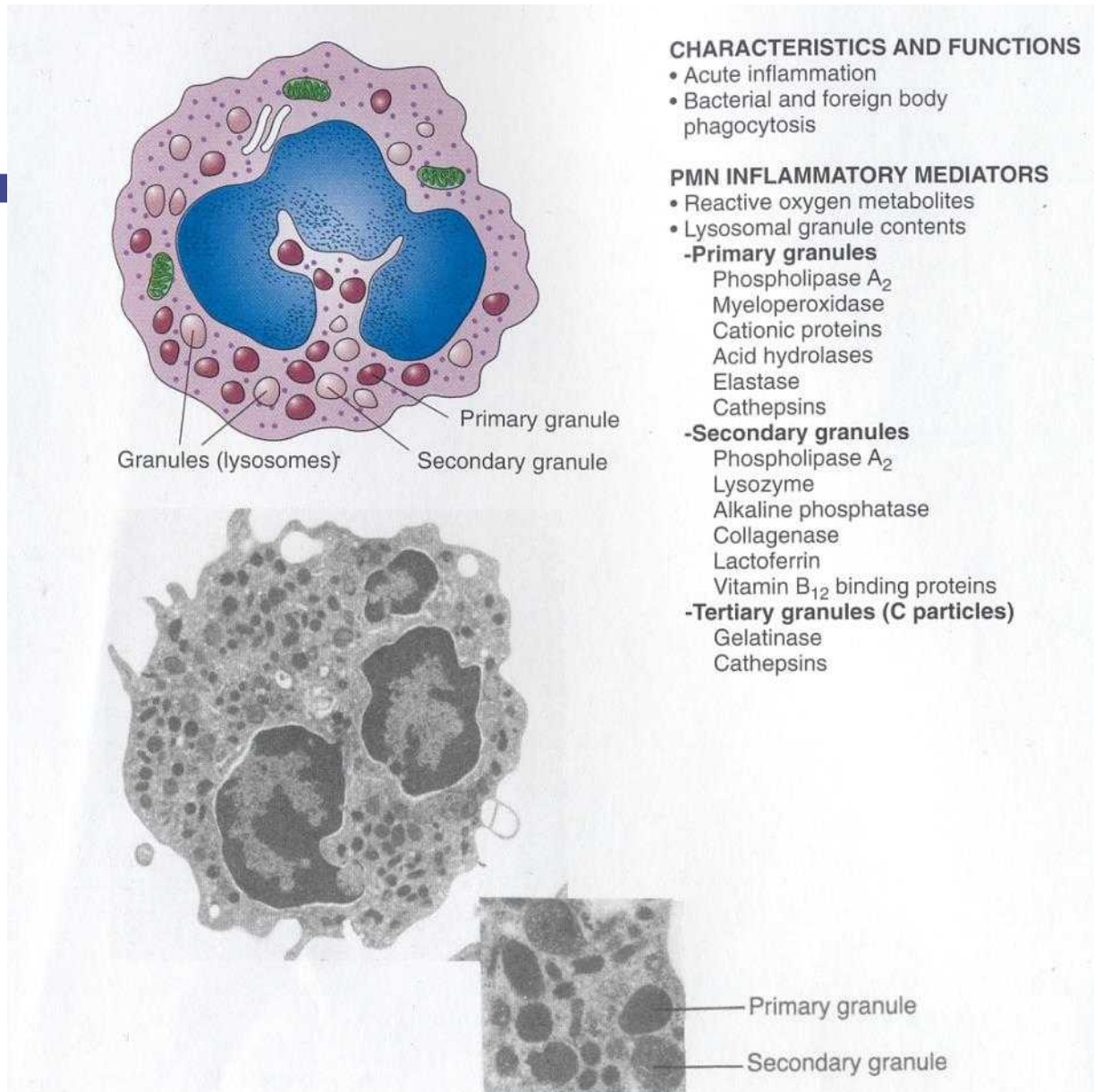
Inflammatory cells

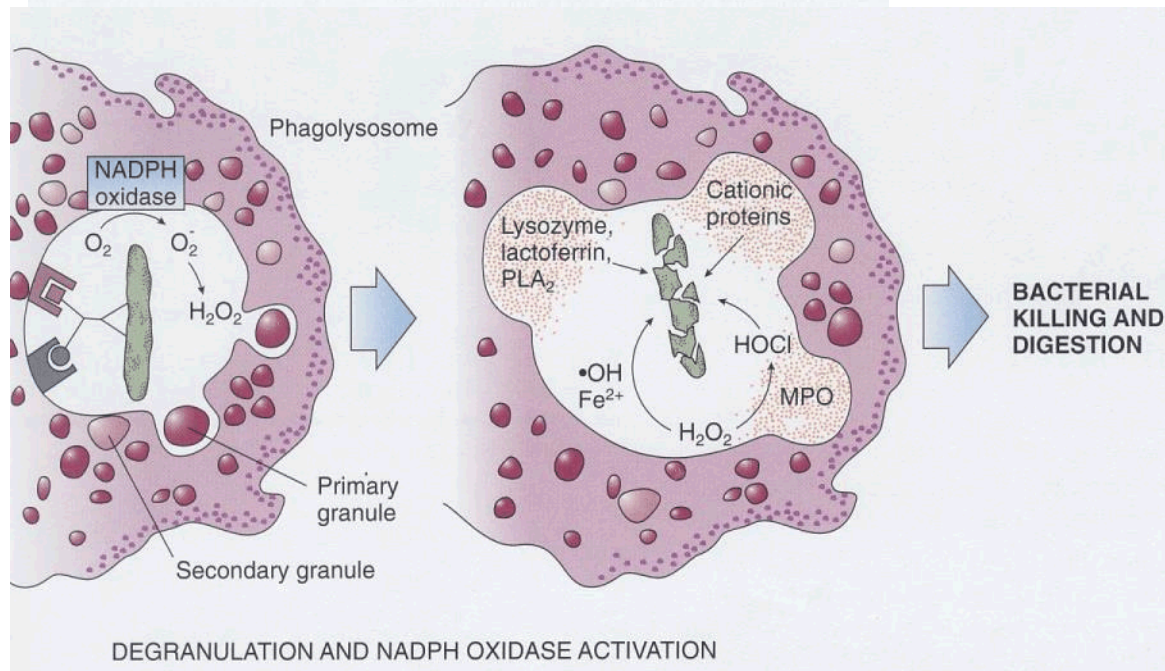
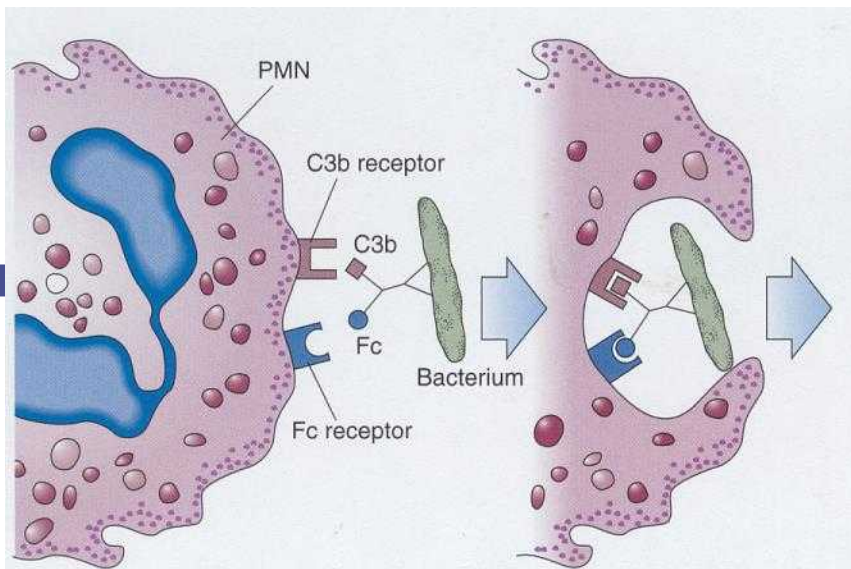
NEUTROPHILS

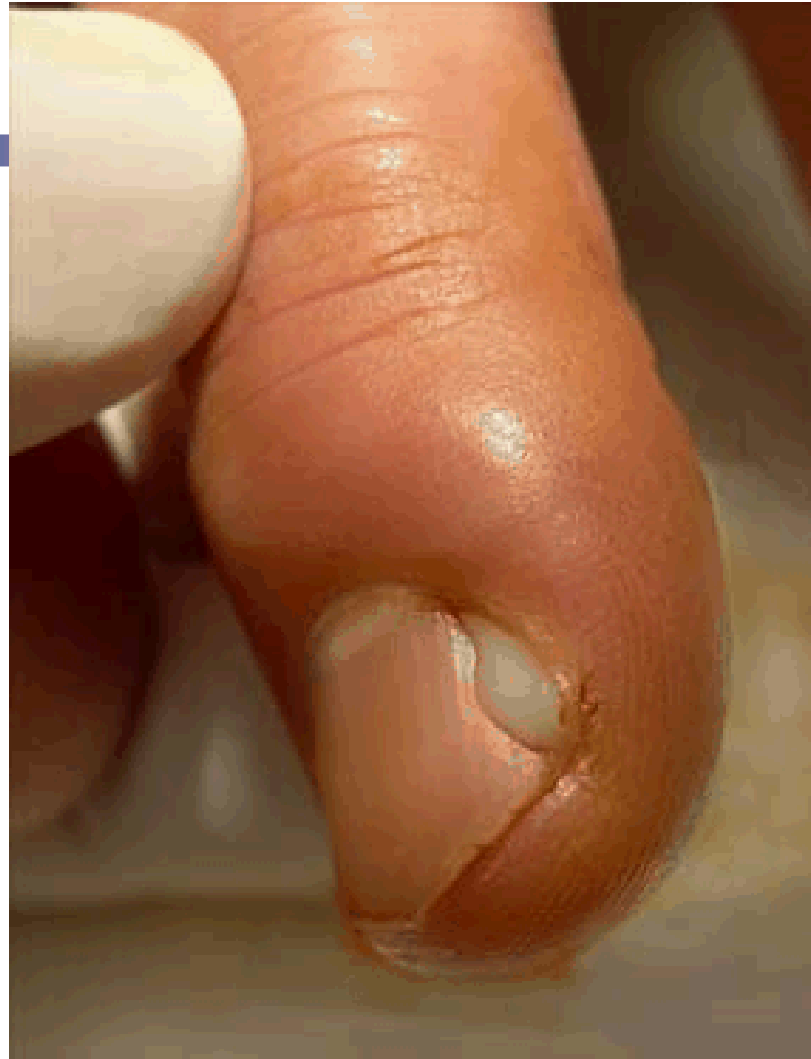
Eosinophils

Macrophages









purulent paronychia

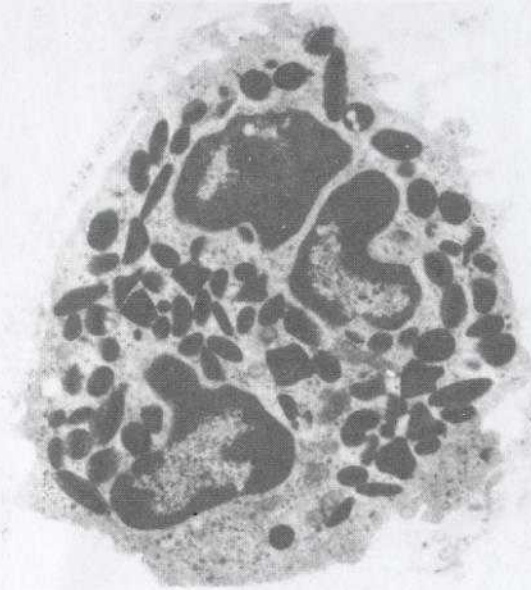
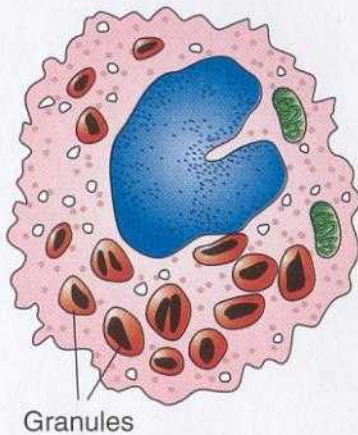


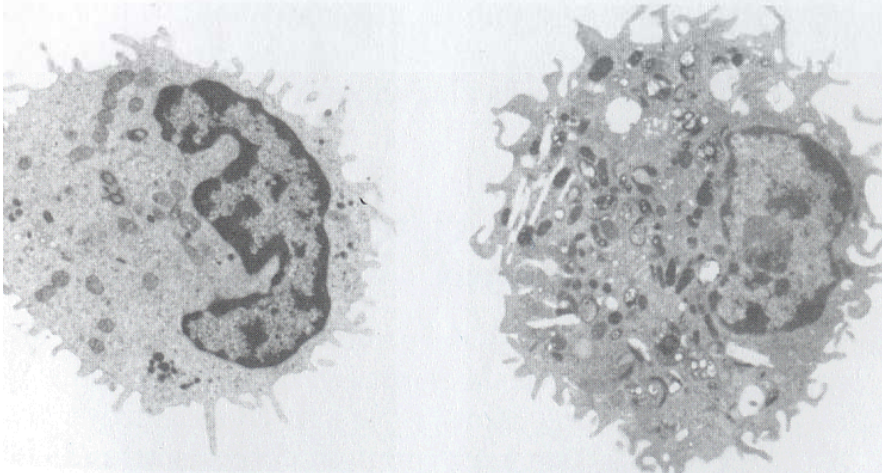
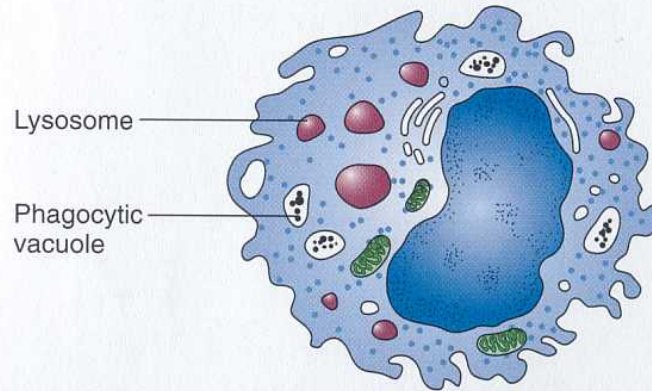
FIGURE 2-24
Eosinophils: morphology and function.

CHARACTERISTICS AND FUNCTIONS

- Associated with:
 - Allergic reactions
 - Parasite-associated inflammatory reactions
 - Chronic inflammation
- Modulates mast cell-mediated reactions

PRIMARY INFLAMMATORY MEDIATORS

- Reactive oxygen metabolites
- Lysosomal granule enzymes (primary crystalloid granules)
 - Major basic protein
 - Eosinophil cationic protein
 - Eosinophil peroxidase
 - Acid phosphatase
 - β -glucuronidase
 - Arylsulfatase B
 - Histaminase
- Phospholipase D
- Prostaglandins of E series
- Cytokines



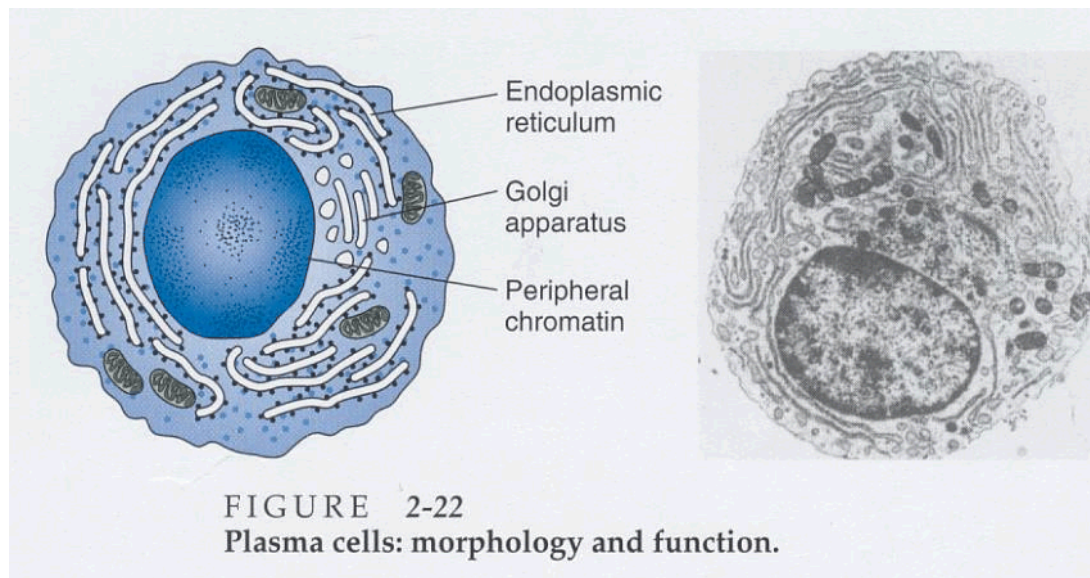
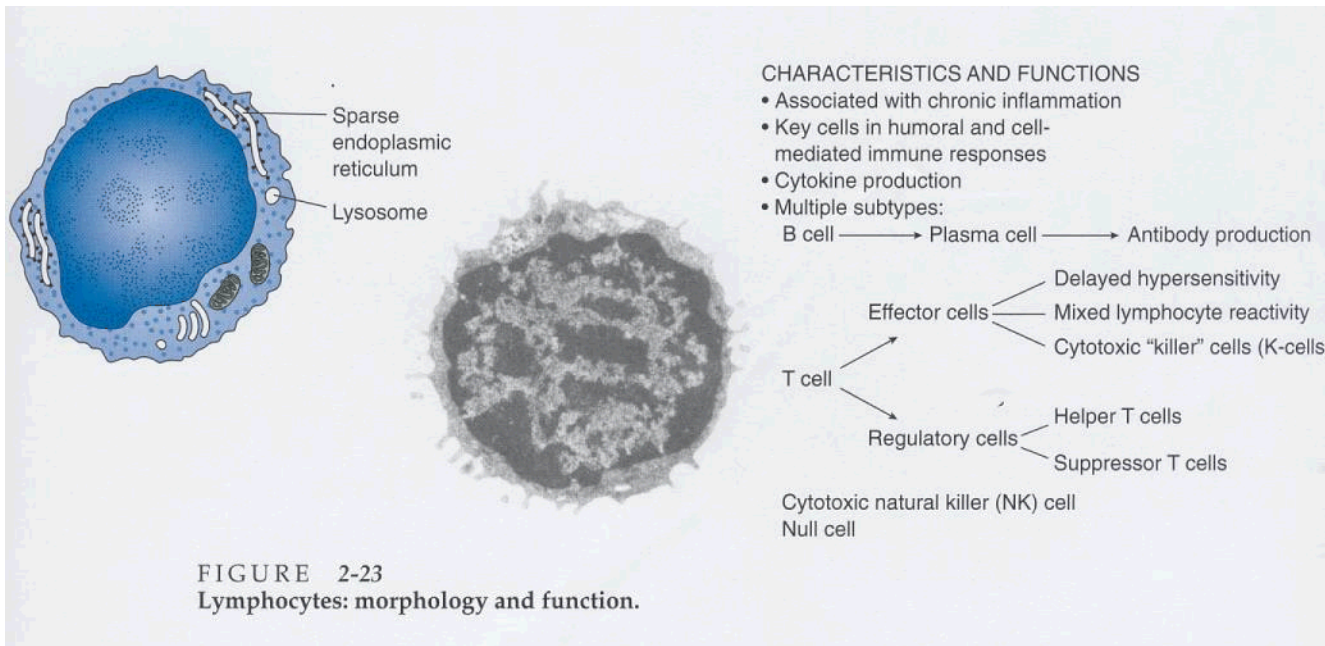
CHARACTERISTICS AND FUNCTIONS

- Regulates inflammatory response
- Regulates coagulation/fibrinolytic pathway
- Regulates immune response (see Chapter 4)

PRIMARY INFLAMMATORY MEDIATORS

- cytokines
 - IL-1
 - TNF- α
 - IL-6
 - Chemokines (e.g. IL-8, MCP-1)
- lysosomal enzymes
 - acid hydrolases
 - serine proteases
 - metalloproteases (e.g. collagenase)
- cationic proteins
- prostaglandins/leukotrienes
- plasminogen activator
- procoagulant activity
- oxygen metabolite formation

FIGURE 2-20
Monocytes/macrophages: morphology and function.



CHARACTERISTICS AND FUNCTIONS

- Associated with:
 - antibody synthesis and secretion
 - chronic inflammation
- Derived from B lymphocytes



Morphology of Inflammation

- **Duration - acute, chronic**
- **Distribution- focal, diffuse**
- **Exudate- serous, purulent, fibrinous**
- **Tissue name - hepatitis, myocarditis**



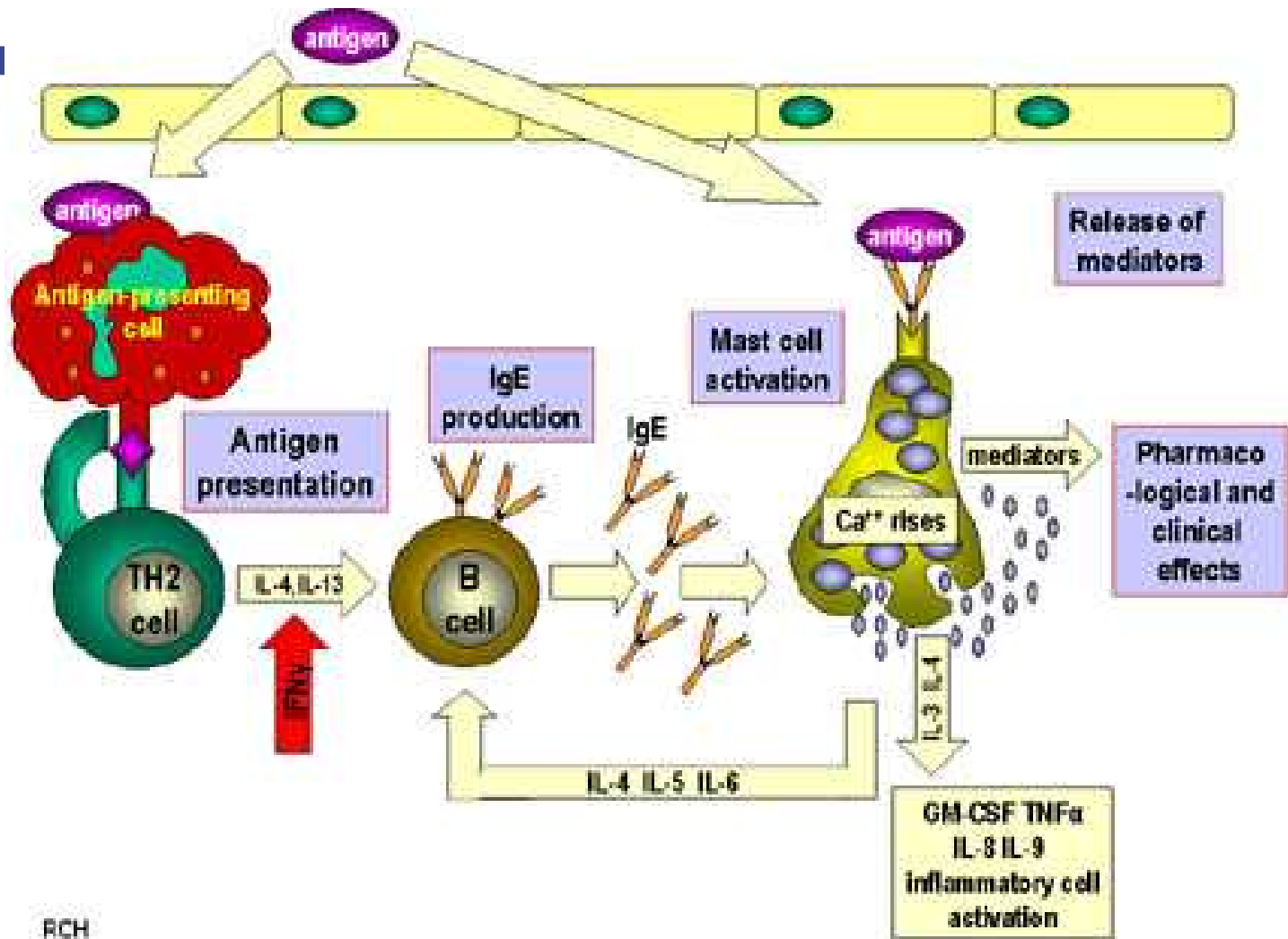


Immune-mediated inflammation (= hypersensitivity)

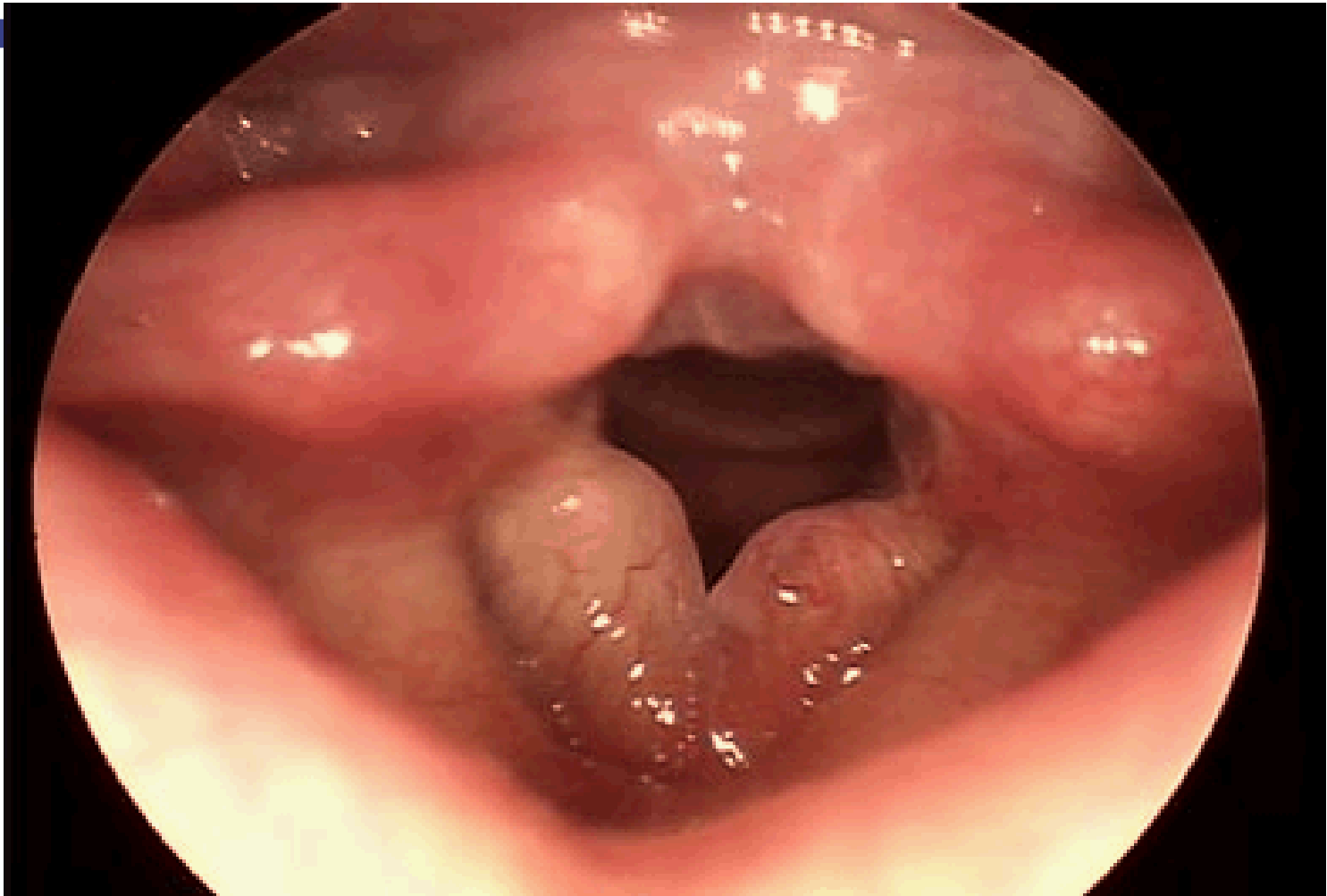
- **Type I**
- **Type II**
- **Type III**
- **Type IV**



Type I

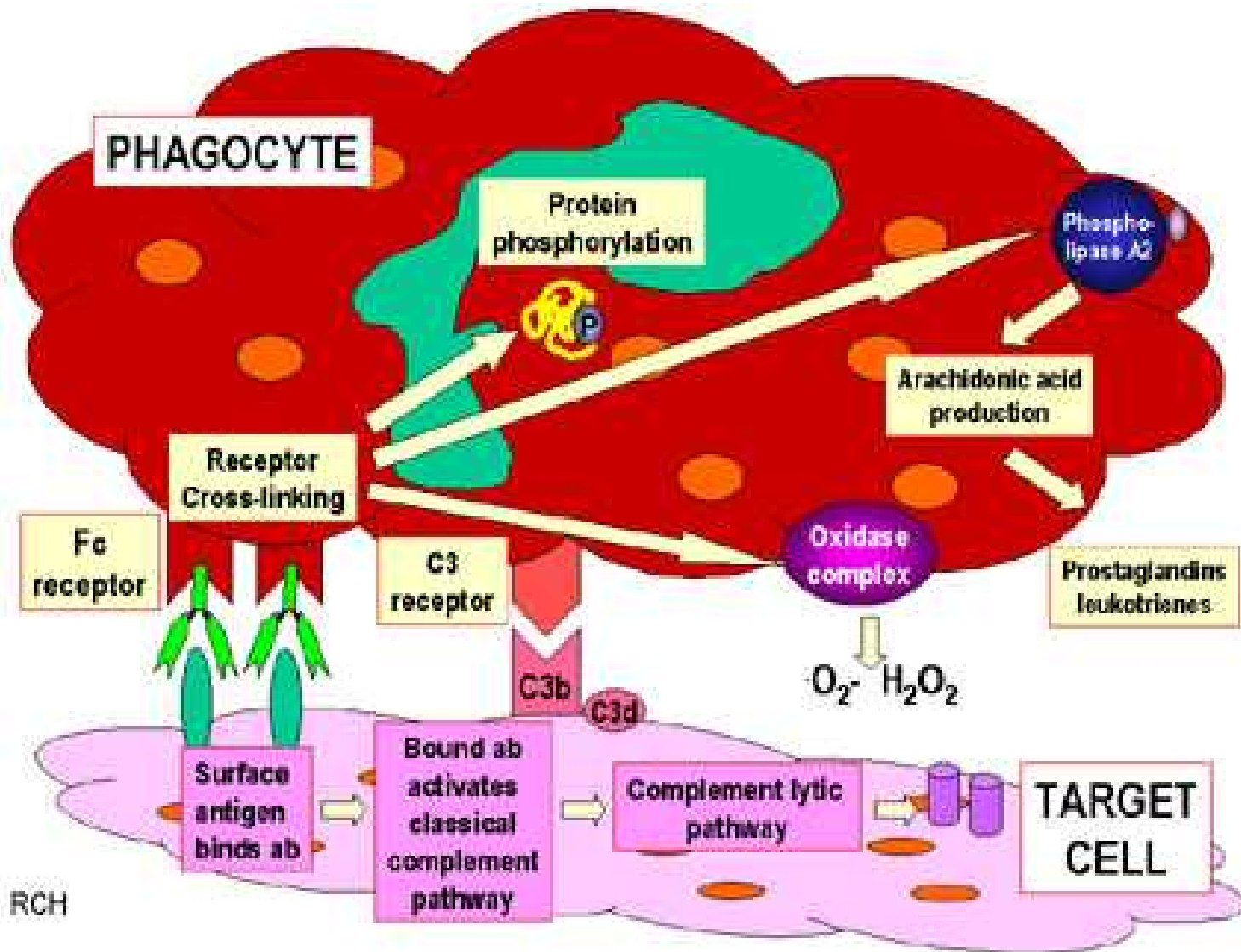


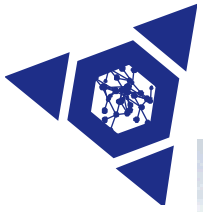
RCH





Type II



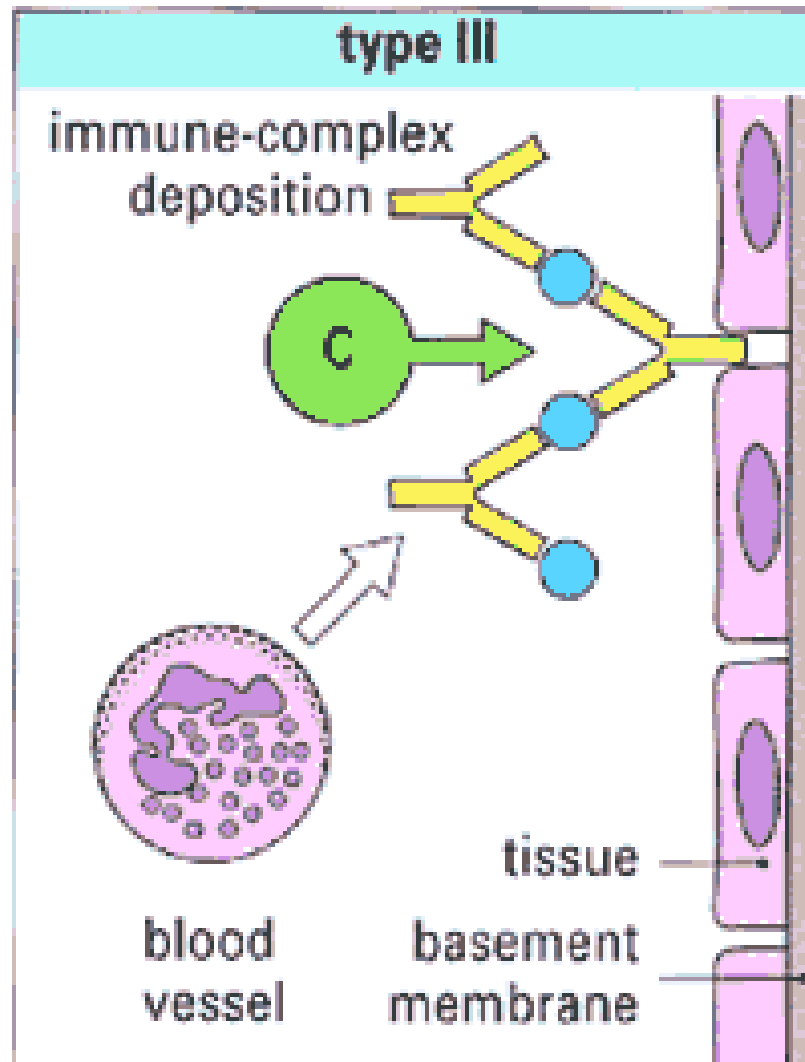


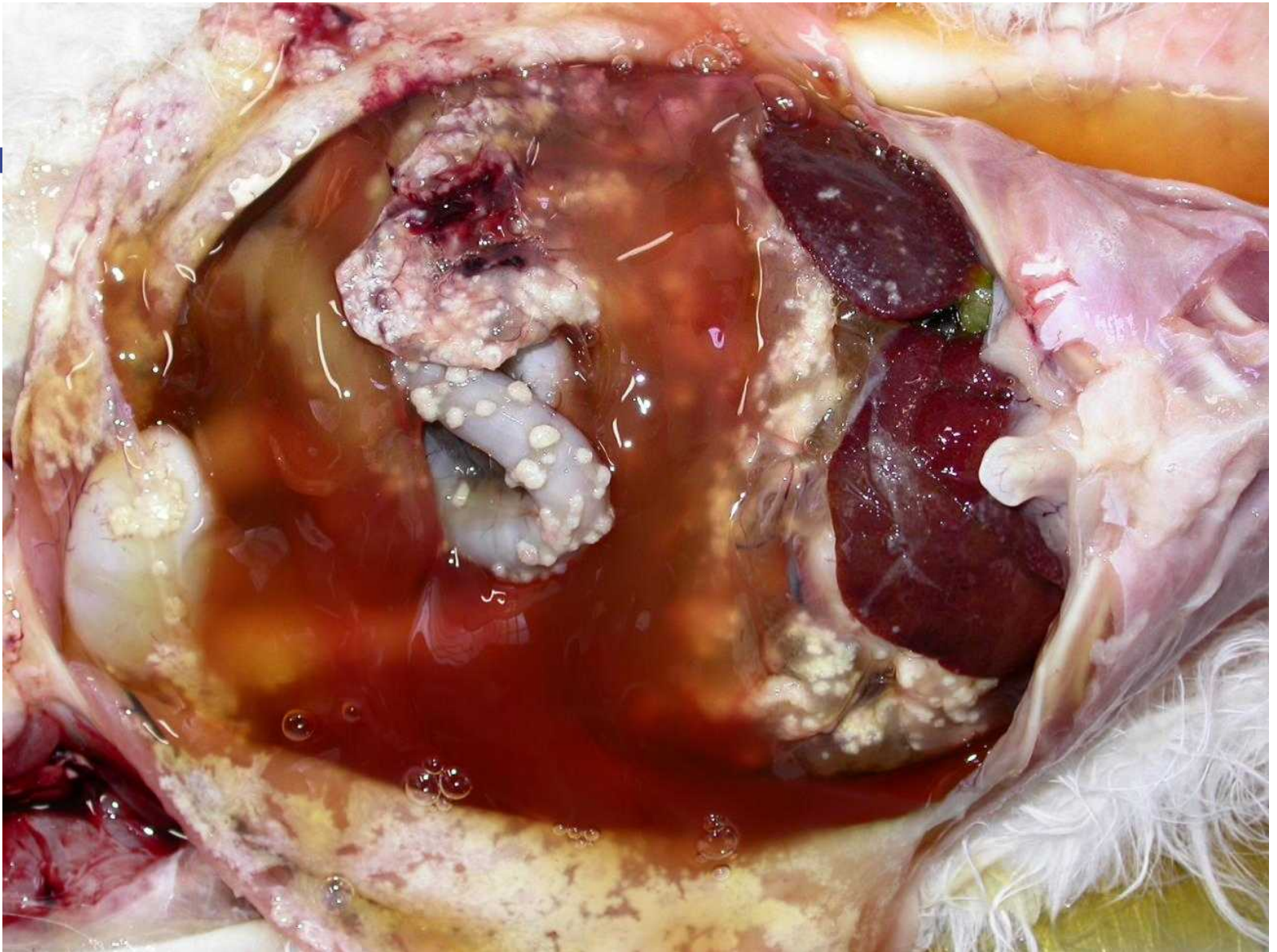
icterus





Type III hypersensitivity







Type IV hypersensitivity





Type IV hypersensitivity

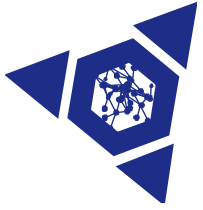




Type IV hypersensitivity



Vesicular dermatitis



Chronic Inflammation

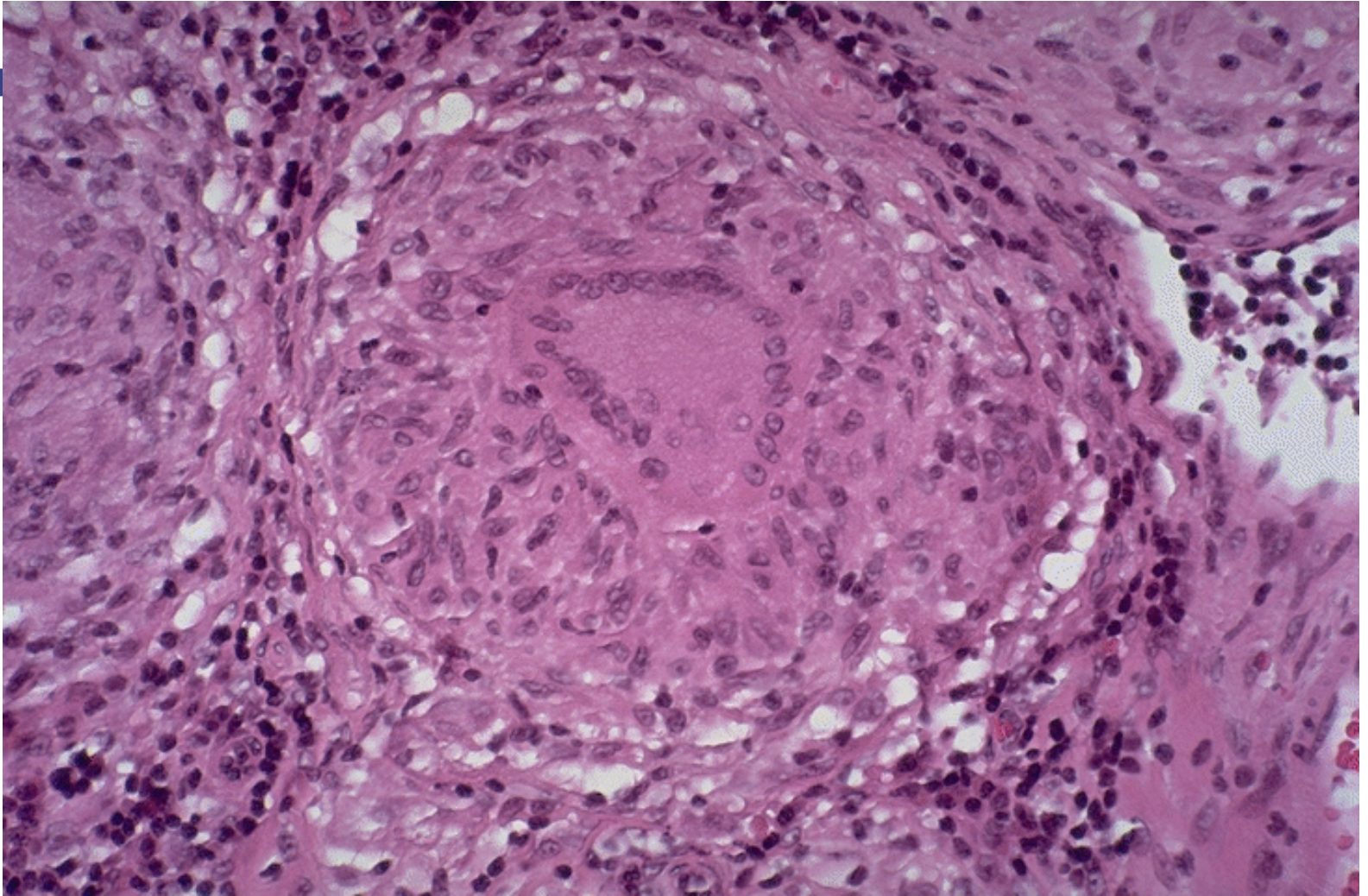
- **Vascular components much less pronounced**
- **Hallmark is MACROPHAGES**
- **Usually some fibrous tissue**



What's a granuloma?

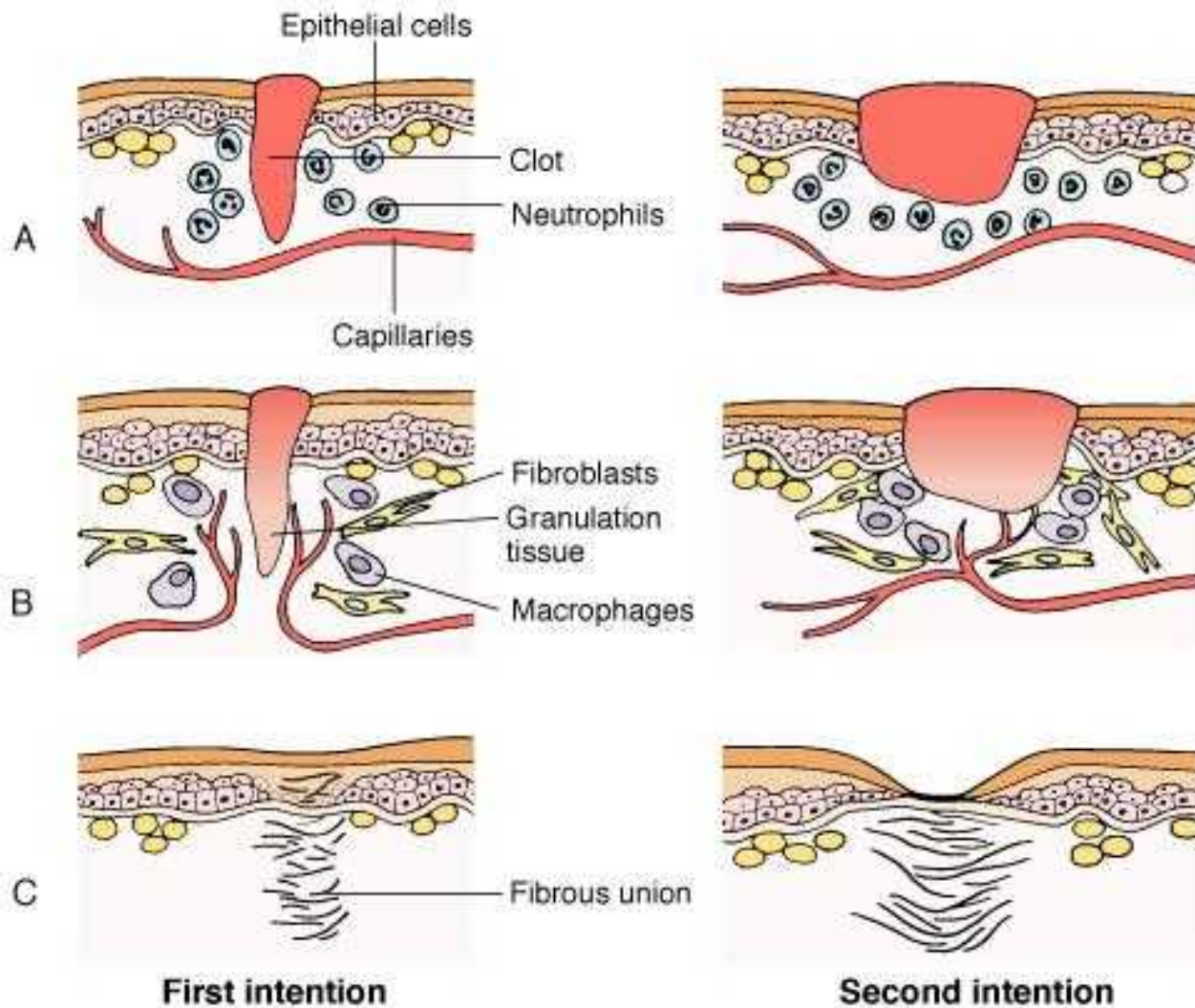


Chronic ulcerative dermatitis





Healing and Repair





Special Cases in Healing

- **Bone – a system all its own**
- **Heart, Brain – doesn't happen!**

