Acute Inflammation

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Definition

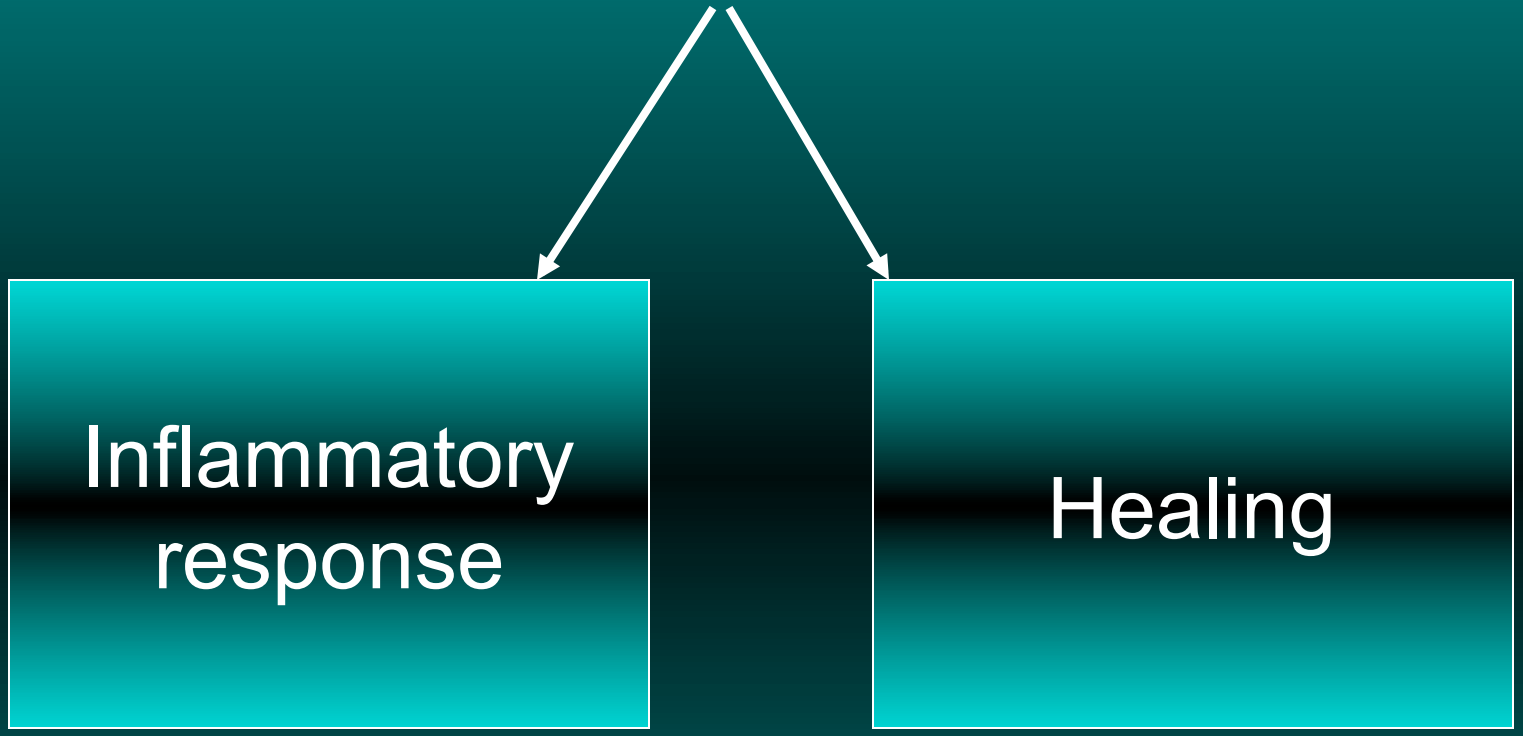
- **Local** response of
- **Living** tissue to
- **Injury**
- Involving a
- **Vascular** response & a
- **Cellular** response
- To eliminate or limit spread of an injurious agent & to remove consequent necrosed cells & tissues

itis

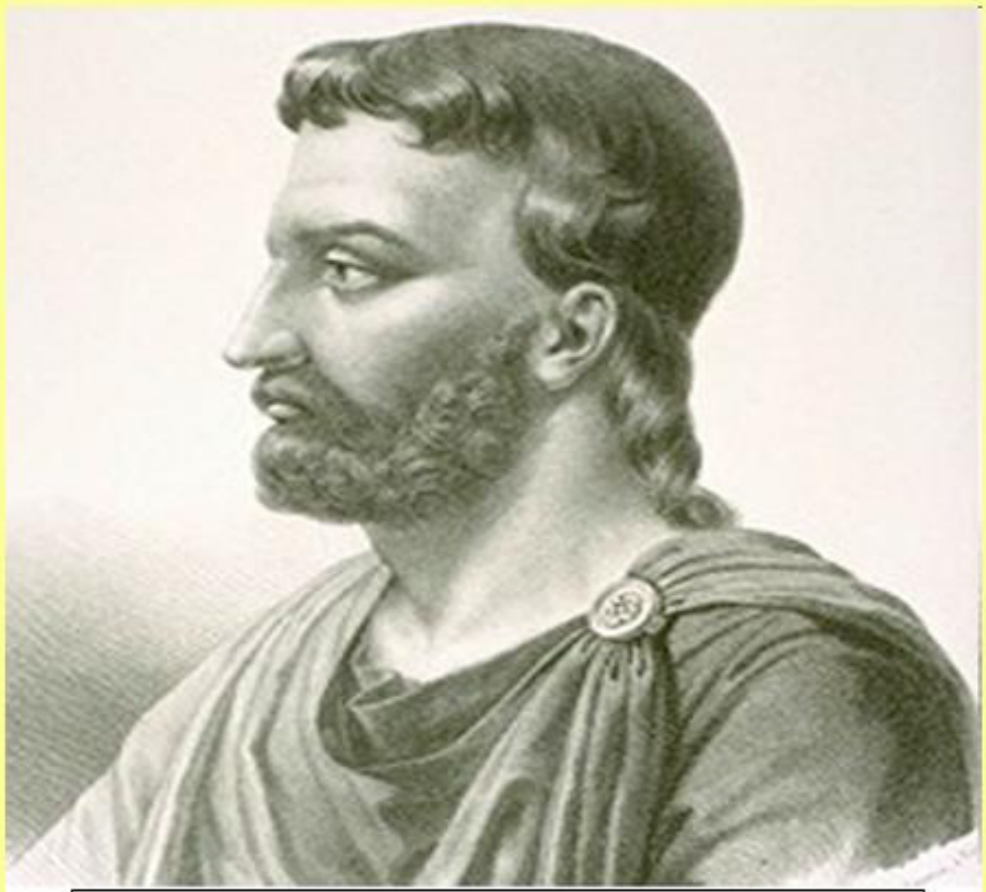
Agents that cause inflammation

- Physical – heat, cold radiation, mechanical
- Chemical – organic and inorganic poisons
- Infective agents – bacteria, viruses, fungi, prions
- Immunological agents – antigen antibody reactions

2 Basic Processes



Acute Inflammation

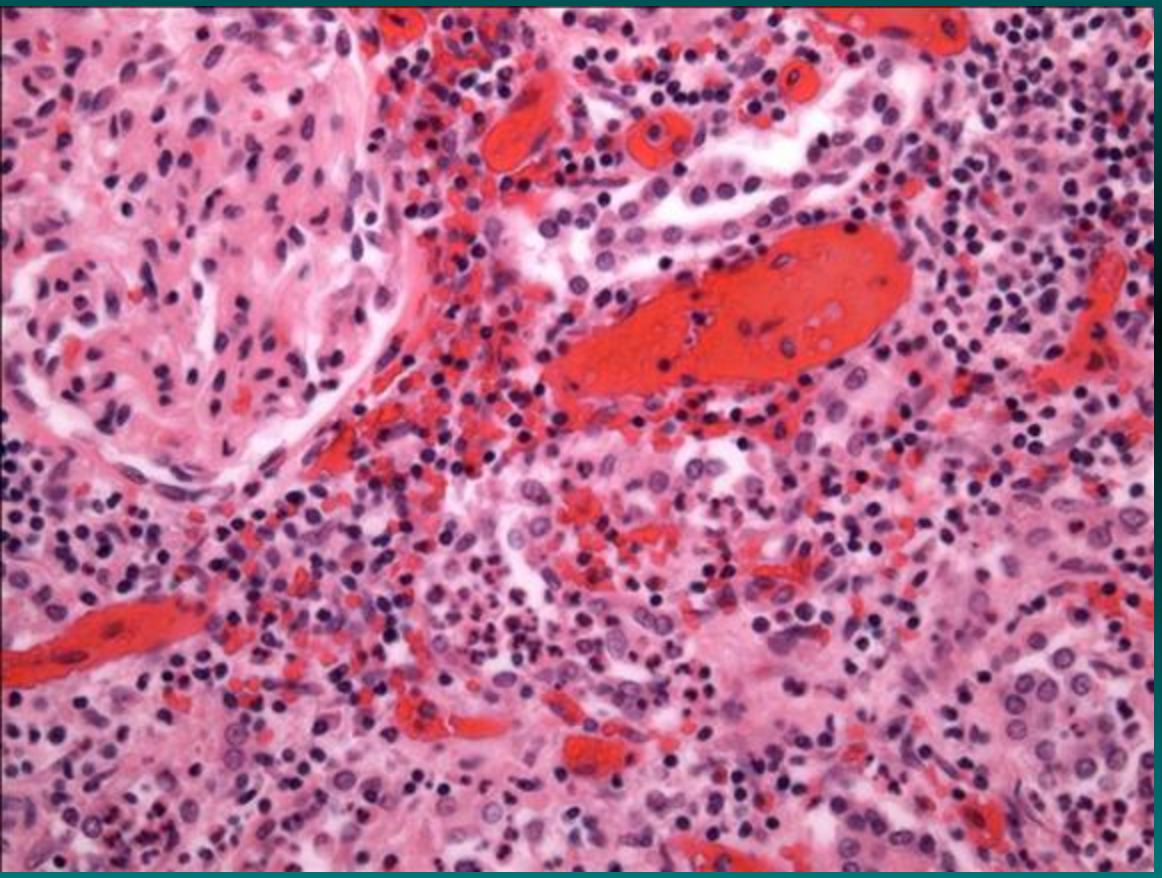


Roman physician
Aulus Cornelius
Celsus

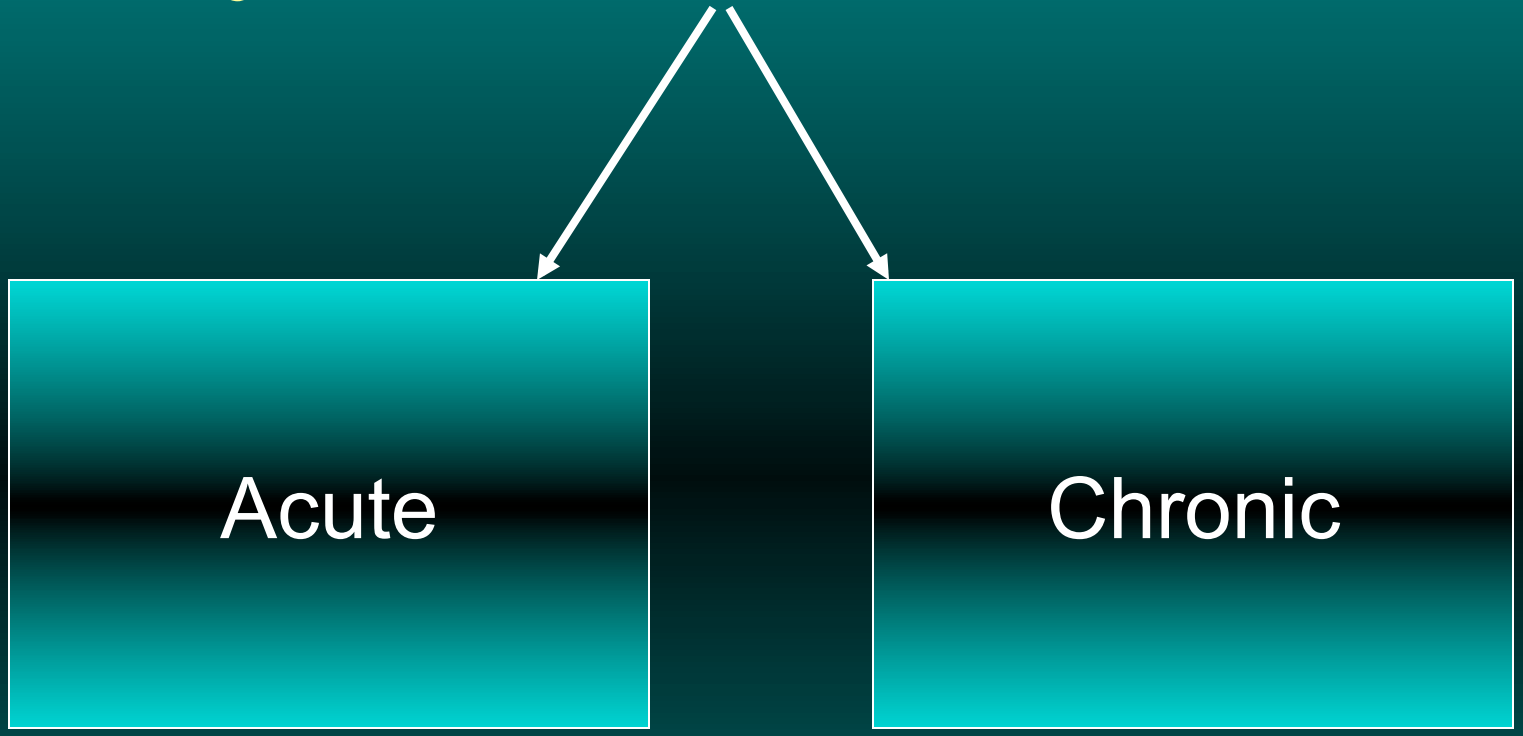
Signs of inflammation

- Rubor – redness
- Tumor – swelling
- Calor – warmth
- Dolor – pain
- Functio laesa – loss of function

Signs of inflammation



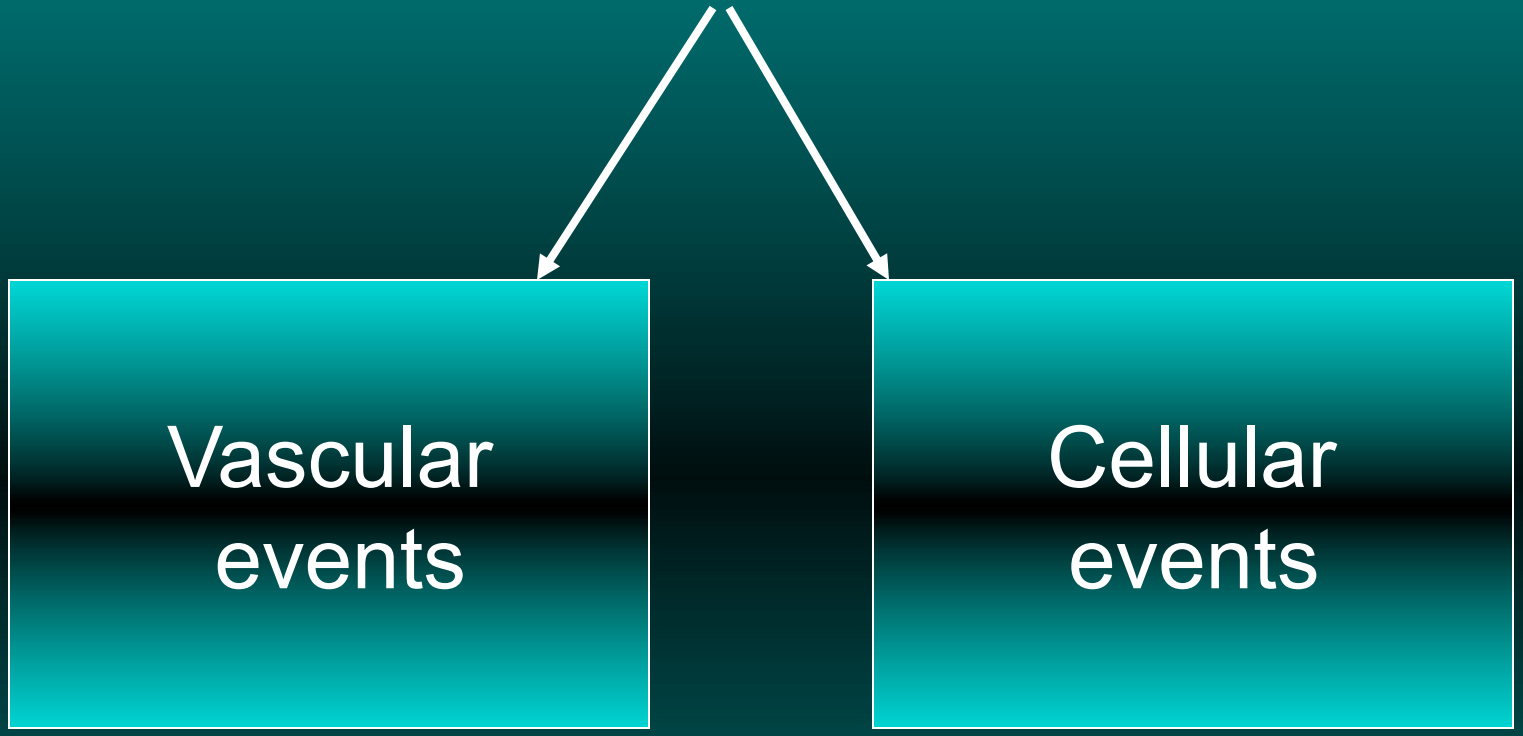
Types of Inflammation



Features of acute inflammation

- Accumulation of fluid and plasma at affected site
- Intravascular activation of polymorphs
- Platelets

Acute Inflammation

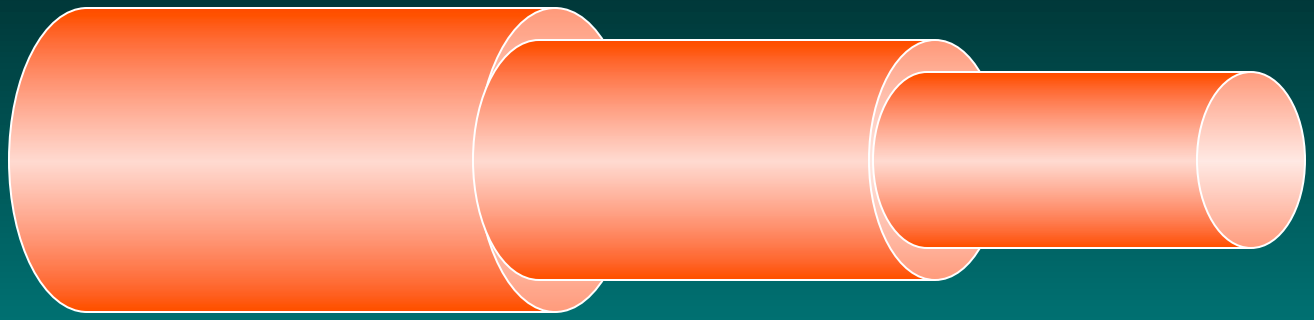


Vascular events

- Alteration in the microvasculature
- Haemodynamic changes and
- Changes in permeability

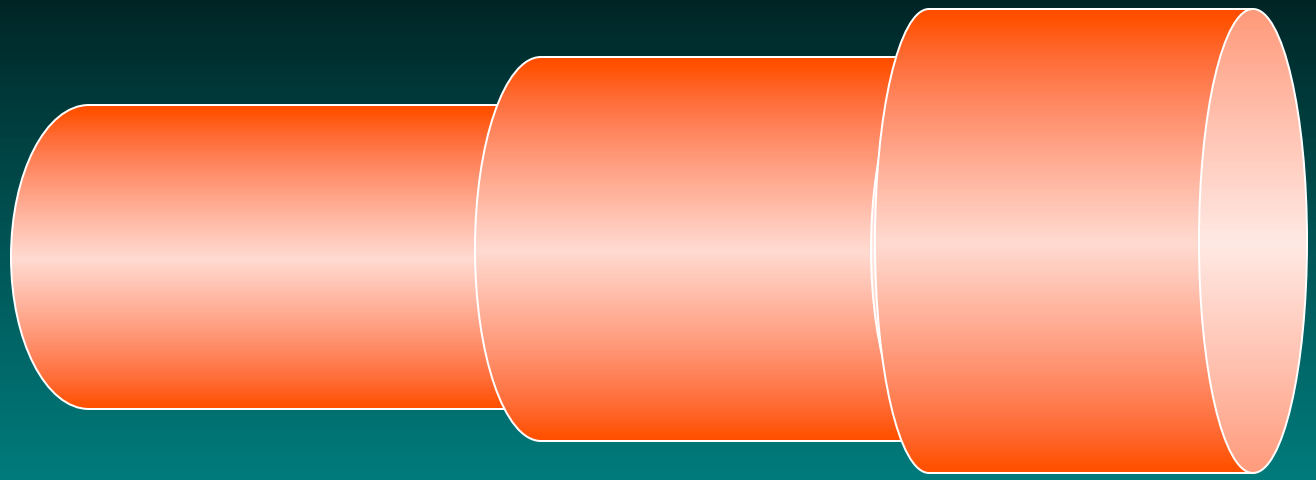
Haemodynamic Changes

Transient vasoconstriction of arterioles



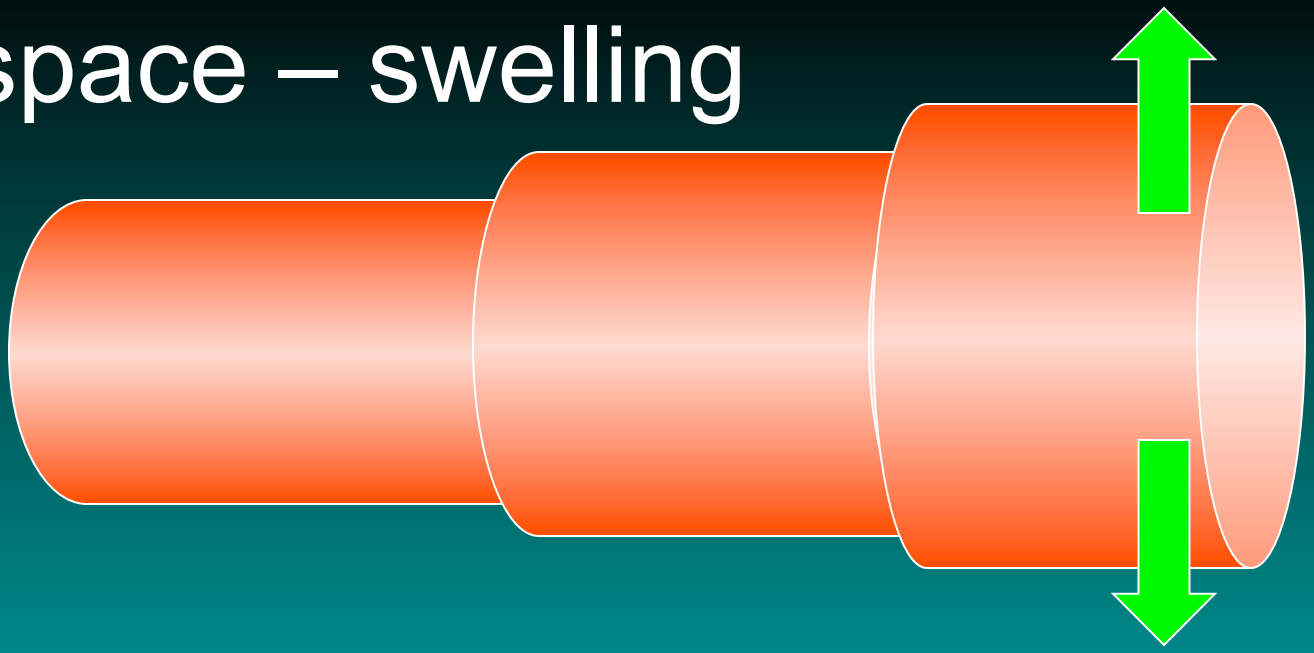
Haemodynamic Changes

Persistent progressive vasodilation – mainly arterioles – redness and warmth

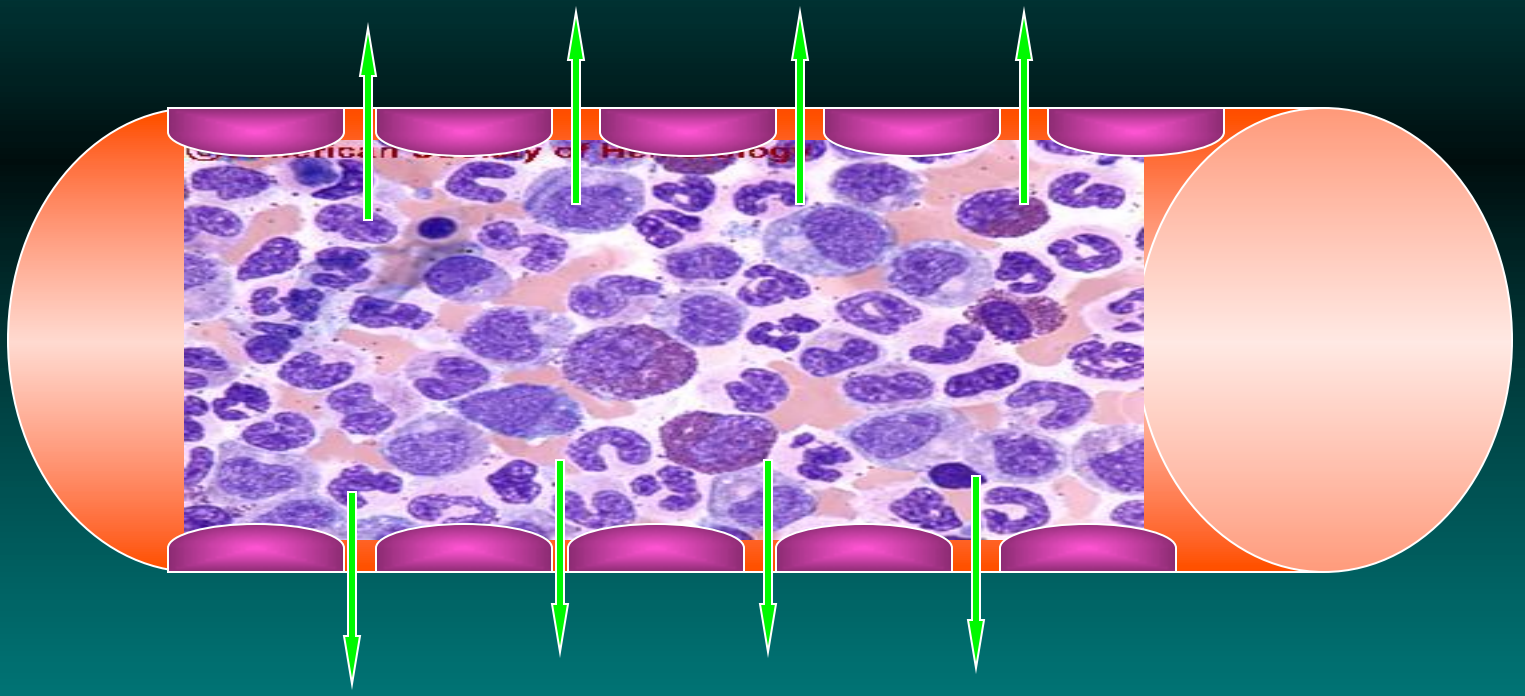


Haemodynamic Changes

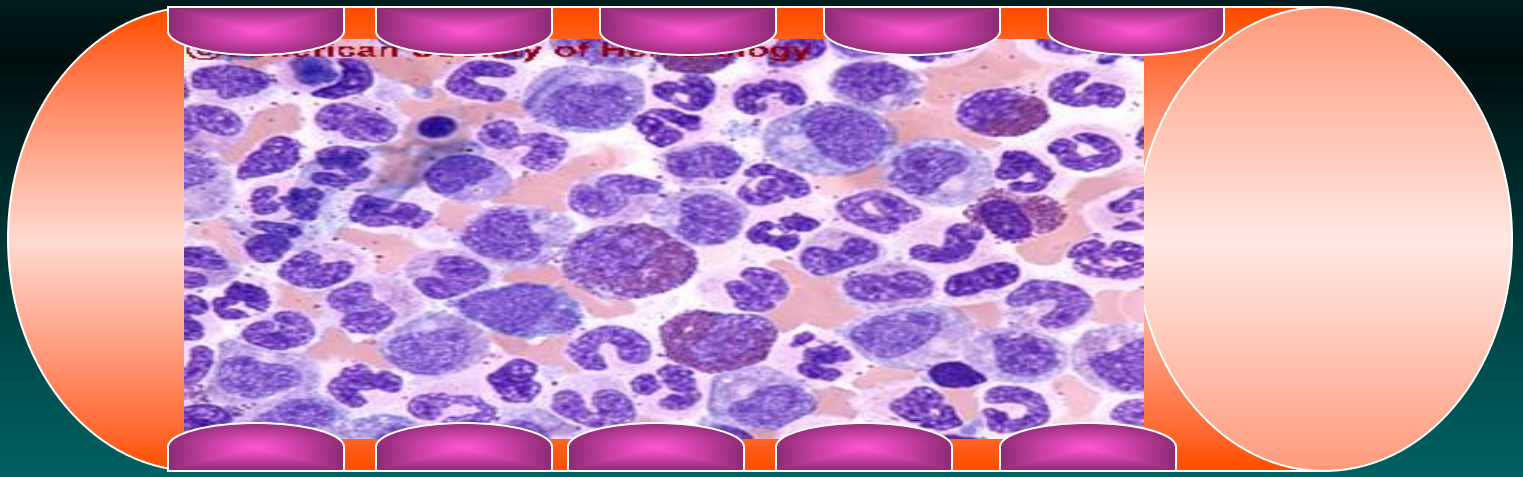
Progressive vasodilation – elevate local hydrostatic pressure – transudation into extracellular space – swelling



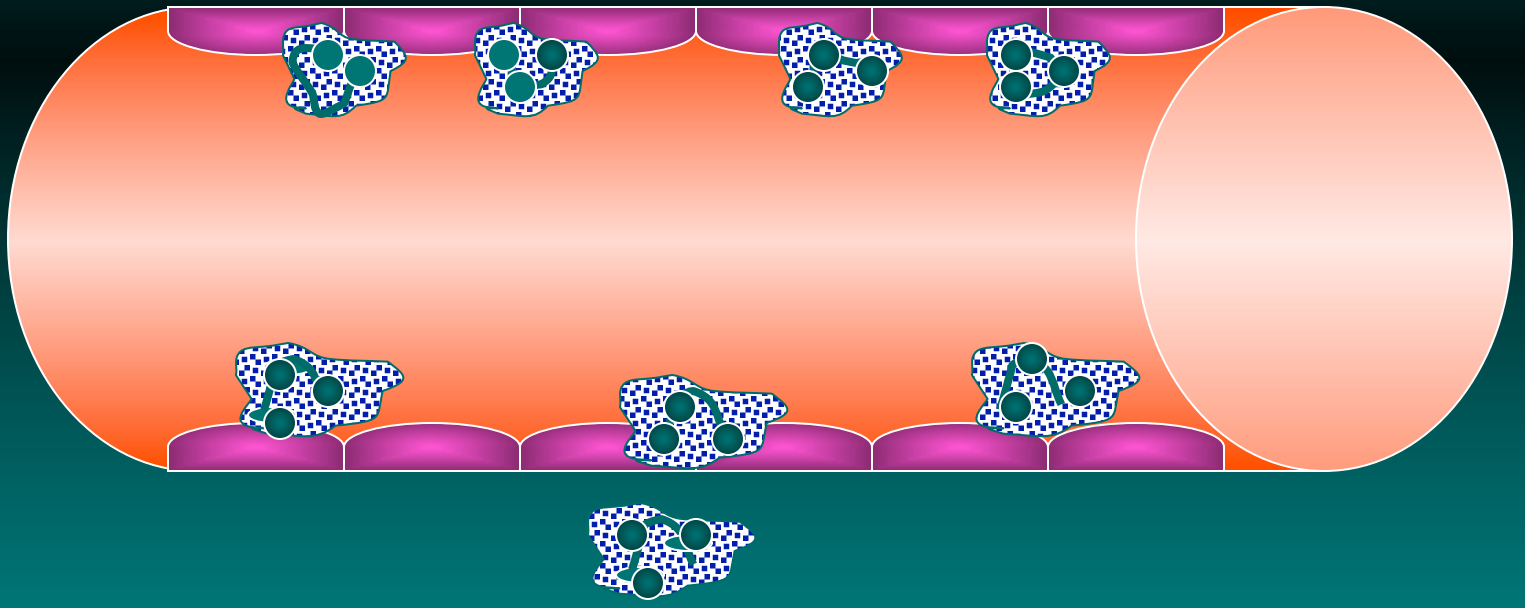
Slowing or stasis of microcirculation – increased permeability of micro-vasculature



Increased concentration of cells – raised blood viscosity



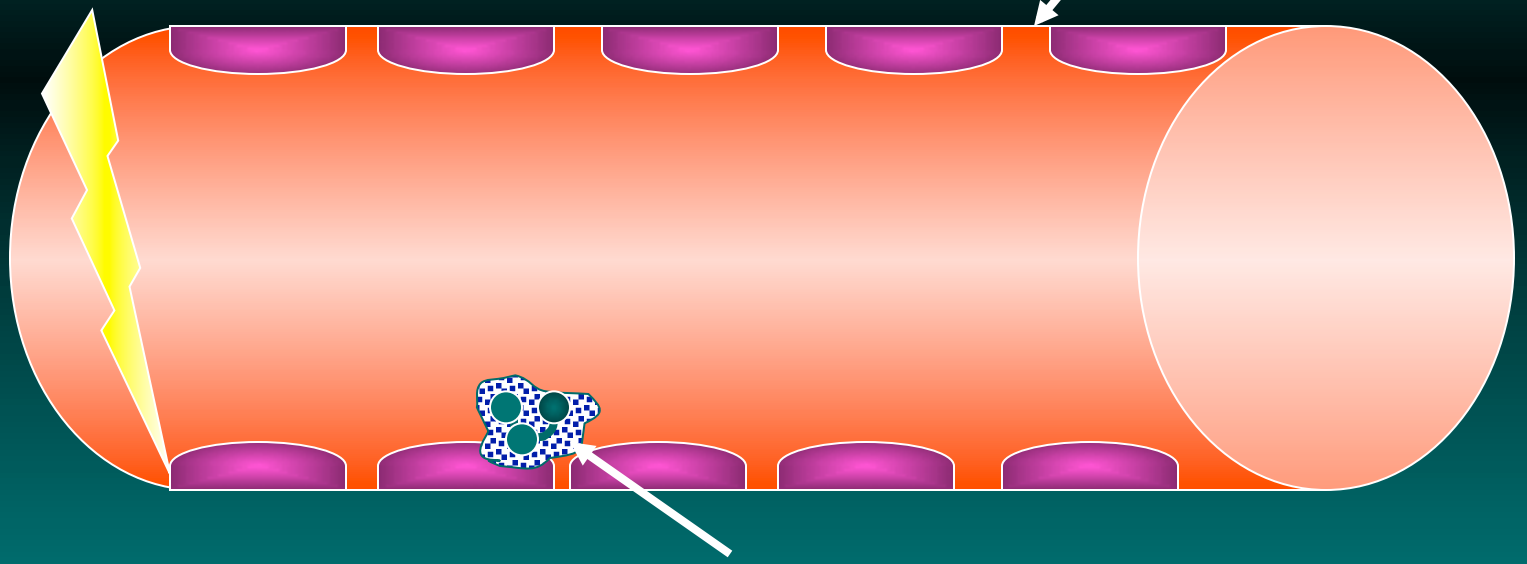
Leucocytic margination - emigration



Mechanisms of increased permeability

Contraction of endothelial cells

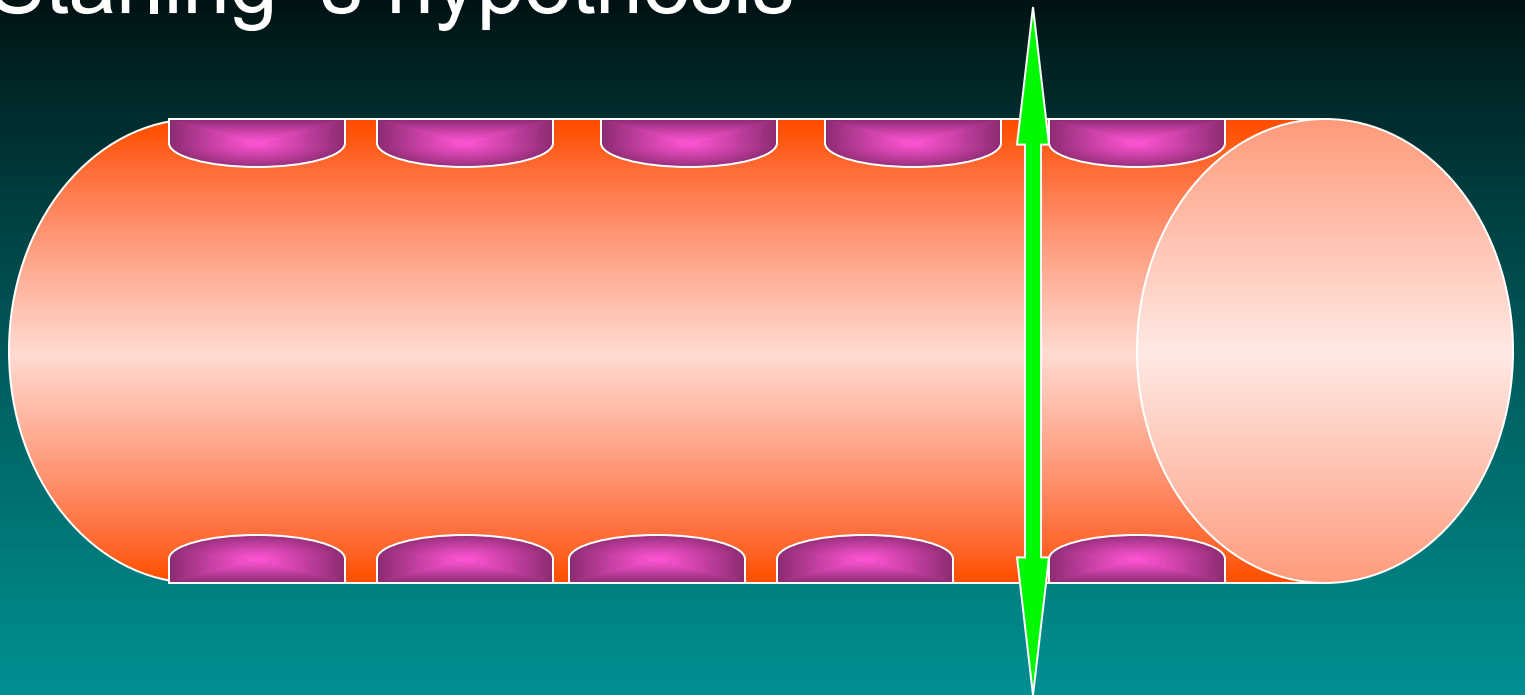
Direct toxic injury



Direct injury by neutrophils

Altered vascular permeability

- Initial escape of fluid due to vasodilation and increase in hydrostatic pressure – a transudate
- Starling's hypothesis



Endothelial changes

Contraction

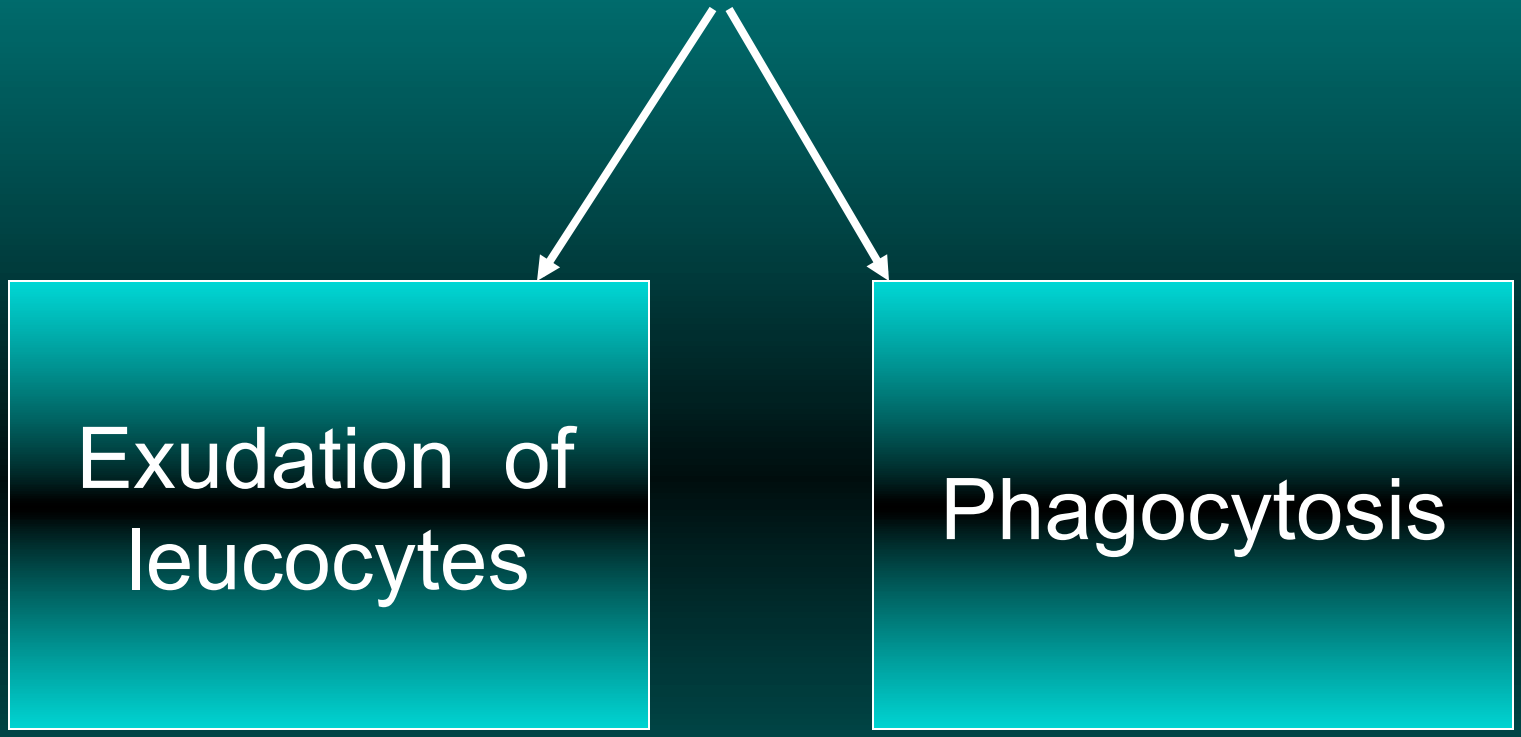
Retraction

Direct Endothelial cell injury

Apoptosis

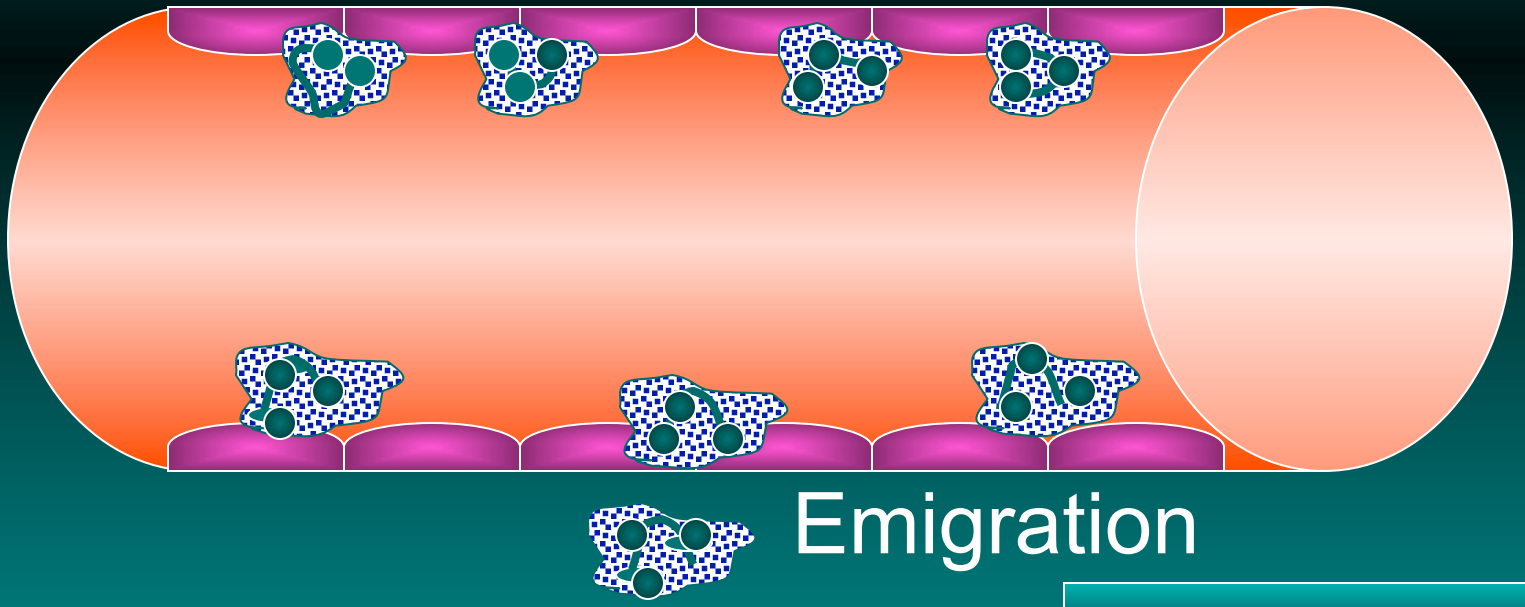
Transcytosis

Cellular events



Cellular events

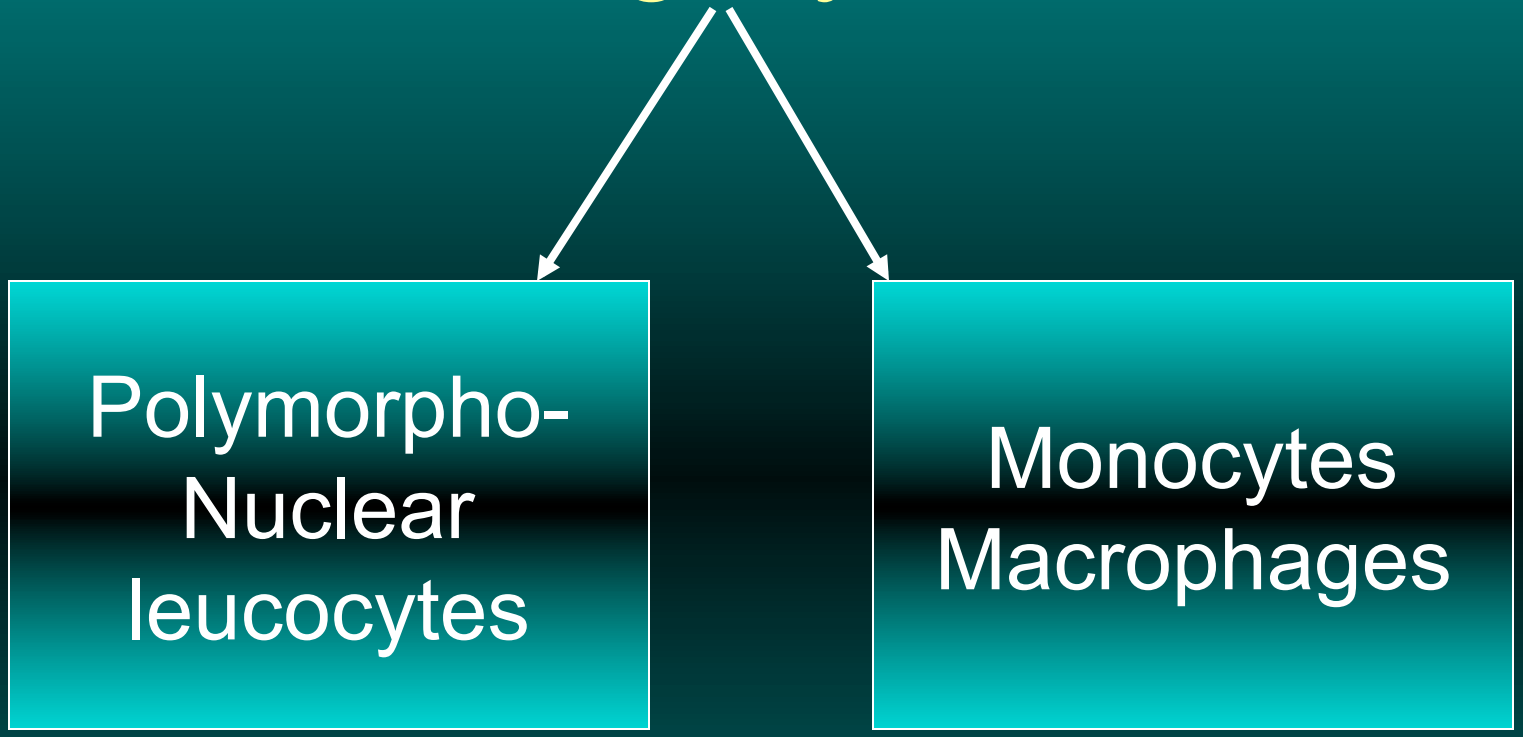
Rolling and adhesion – selectins integrins, Igs



Emigration

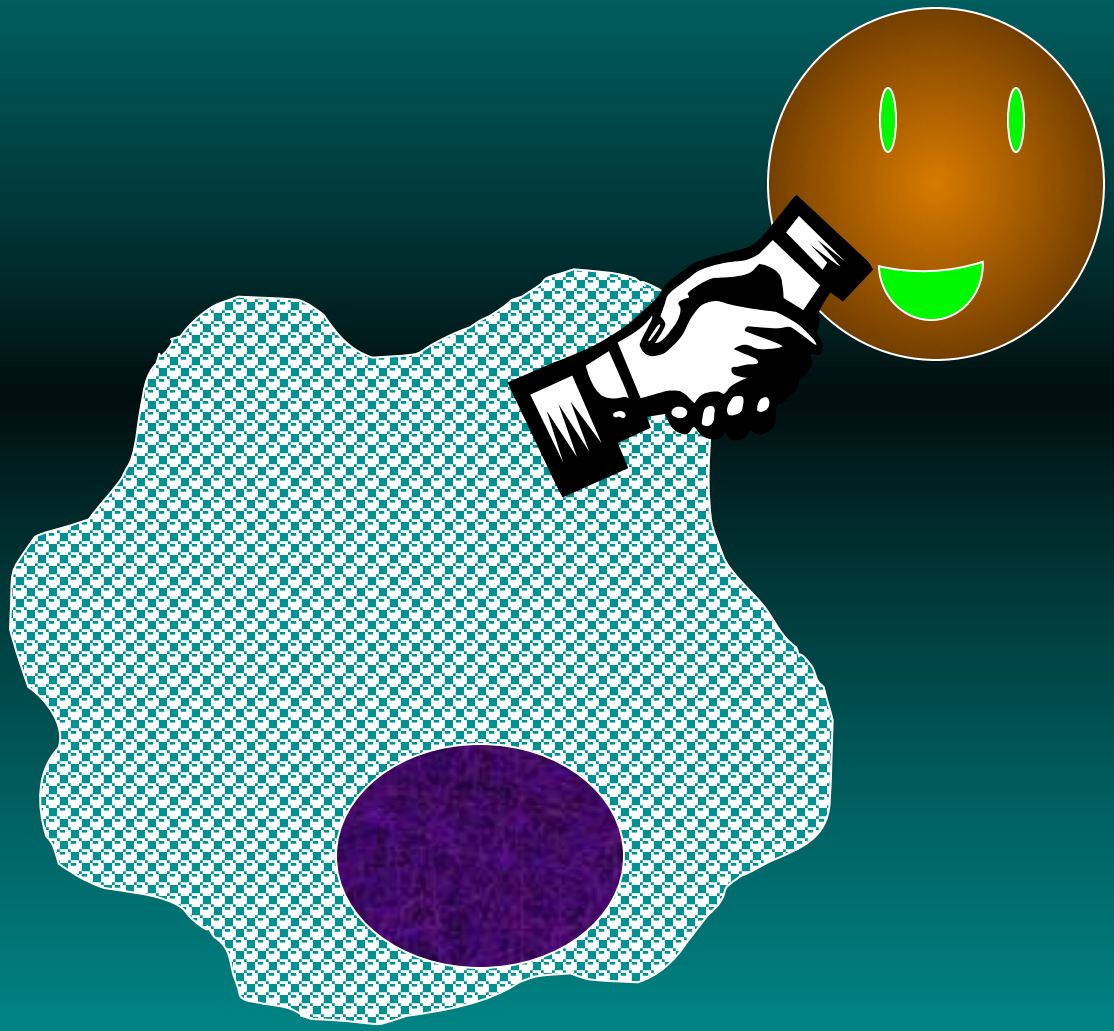
Chemotaxis

Phagocytosis



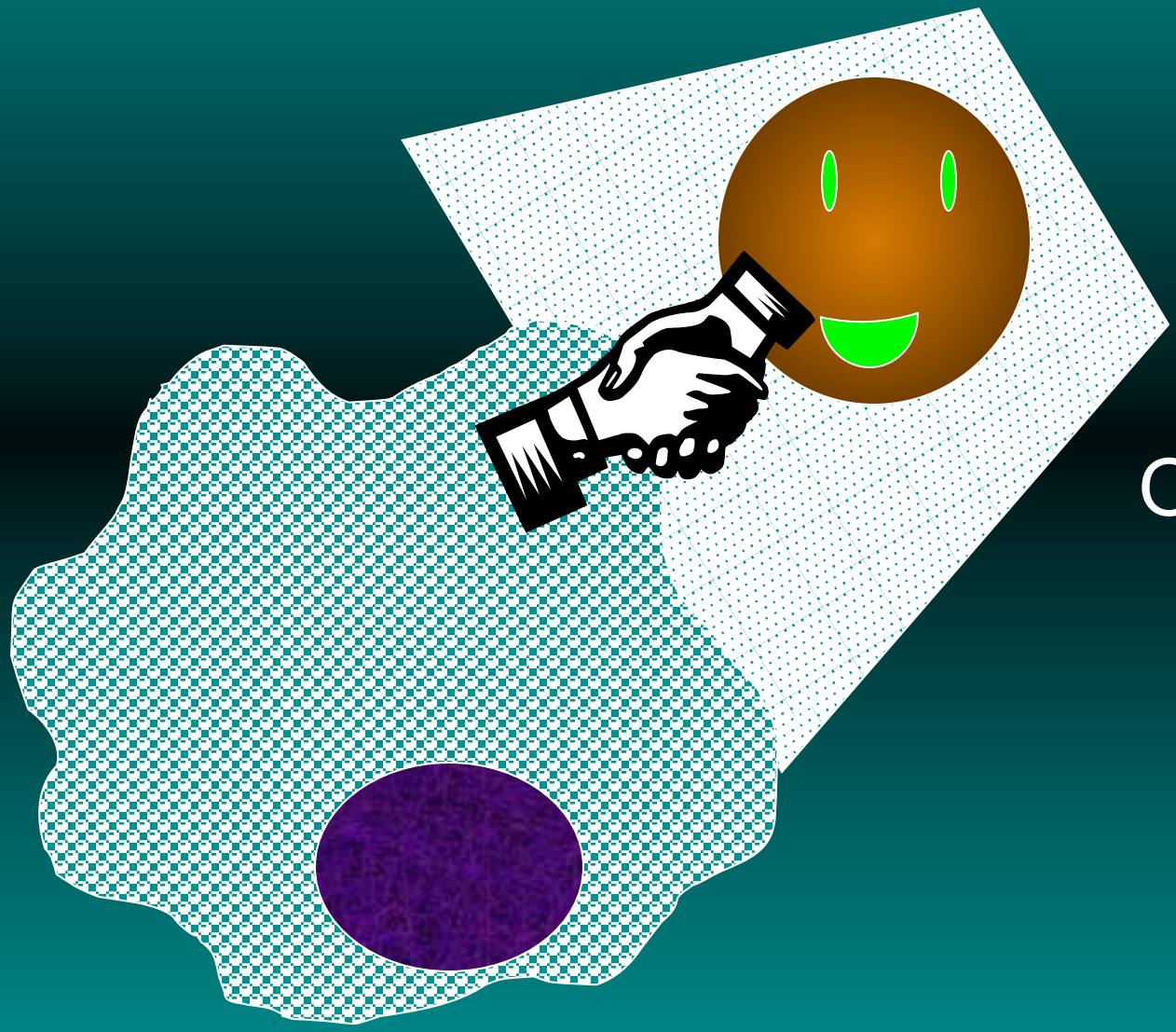
Process of Phagocytosis

Process of Phagocytosis



Recognition
And
attachment

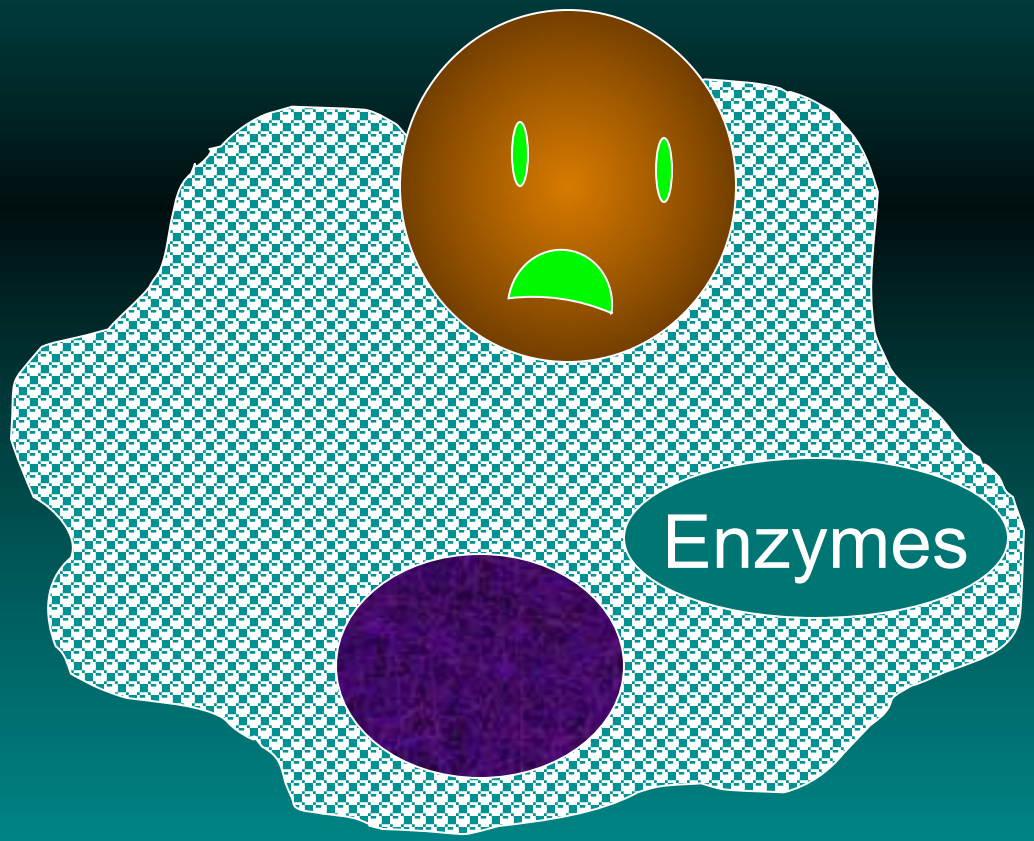
Process of Phagocytosis



Secretion

Opsonization

Process of Phagocytosis



Engulfment

Digestion
And
Degradation

Digestion and Degradation

- Digestion or degradation
- Oxygen dependent bactericidal mechanism
- Oxygen independent bactericidal mechanism
- Nitric oxide mechanism

Sequlae of acute inflammation

- Complete healing or resolution
- Abscess formation
- Granuloma formation
- Chronic inflammation

Thank you