Inflammation

Def.: The host’s protective response to eliminate the initial cause of cell injury as well as the necrotic cells/tissues resulting from that original injury.

Inflammation 1: Acute inflammation: vascular and cellular pathways

Inflammation 2: Chemical mediators and chronic inflammation
Nomenclature of Inflammation

- Acute: hrs—days
- Chronic: weeks—mos.—yrs.

“…itis” : inflammation of

Heart: myocarditis (myocardium)
endocarditis (valves)
Appendix: appendicitis
Colon: colitis

De novo chronic disease
autoimmune, etc.

De novo chronic disease
autoimmune, etc.

Acute Cell / Tissue Injury

Vascular phase

Cellular phase

Abscess

Resolution

Fibrosis (scar)

Hours—days

Weeks—mos—years
Acute Cell / Tissue Injury

1. Vascular Phase
   - Rubor
   - Tumor
   - Calor
   - Dolor
   - Functio laesa

2. Cellular phase

5 Cardinal Signs of Acute Inflammation

Key Players in Inflammation

Injurious agent
- Microbe
- Toxin
- Radiation
- Burn

damaged cell

Extracellular matrix (ECM)

leukocytes (& their mediators)

blood vessel

resident WBC's

plasma proteins

endothelial cell

mac

mast cell
Vascular Phase of Acute Inflammation
Mechanisms of increased vascular permeability

1. Immediate Transient Response
   - Histamine
   - Bradykinin
   - Leukotrienes

2. Immediate Sustained Response (endothelial injury—burns)

3. Delayed Prolonged Leakage (endothelial damage: thermal-toxin-X/UV ray)

- Increased blood flow
- Expansion of capillary bed
- Venule dilation
- Neutrophil emigration
- Leakage of plasma proteins → edema
Cellular phase of Acute Inflammation
MARGINATION of WBC’s

ROLLING with transient adhesions
ROLLING with transient adhesions

ADHESION (firm)
Toll-like receptors (TLR)

- Homology to Drosophila
- Family of PPR’s (pattern recognition receptors)
- TLR 4: LPS (endotoxin)
### DEFECTS IN LEUKOCYTE FUNCTION

<table>
<thead>
<tr>
<th>Leukocyte Adhesion Def. 1 (LAD-1)</th>
<th>Leukocyte Adhesion Def. 2 (LAD-2)</th>
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<tr>
<td>[ICAM-1]</td>
<td>P-selectin</td>
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<td>Adhesion</td>
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<th>Chronic Granulomatous Disease (CGD)</th>
<th>Chediak-Higashi Syndrome</th>
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<td>NADPH Oxidase defect</td>
<td>impaired fusion</td>
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#### Acute Appendicitis

- **fecalith**
- **mucus**
- **transmural inflammation**
- **impaired venous drainage**
- **fibrinous exudate**
Streptococcus pneumoniae

alveolar space

Acute Pneumonia
20

Acute Inflammation

Vascular phase

Cellular phase

Chronic inflammation

De novo chronic disease
autoimmune, etc.

L
PL
mac

PMN

Exceptions:
allergy/drugs/
parasites

eos

viral infections

De novo chronic disease
autoimmune, etc.

Abscess

Resolution

Fibrosis
(scar)

Hours---days

Weeks---mos---years