INFLAMMATION

L30- TYPES OF INFLAMMATION

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Chronic inflammation

- Other types of cells present
- *B & T lymphocytes*

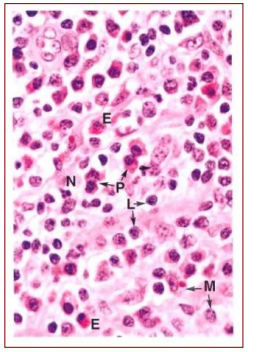
(antibody and cell mediated immunity)

- *Plasma cells*

(produce antibodies)

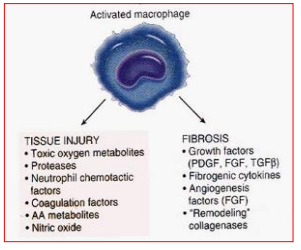
- *Eosinophils*

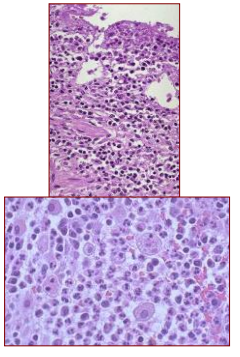
(contain major basic protein, toxic to parasites)



Macrophage – Tissue destruction

- Macrophages can produce tissue destruction when inappropriately activated.





CHRONIC INFLAMMATION

Inflammation which persists over a period of time

- Lymphatics –

involvement variable - +/-

proliferation and activation

- Clinical Signs: Primarily dependent upon duration of the illness and inflammatory lesions

MONOCYTES

- Substances those induce fibrosis includes, growth factors
  - PDGF - platelet derived growth factor,
  - FGF - fibroblast growth factor,
  - TGFβ - transforming growth factor β).
- In cases of clearance of irritant, macrophages die or drain off through lymphatics to lymph nodes.
- The fusion of macrophages to form giant cells may occur under the influence of **IL-4** and **IFN**.

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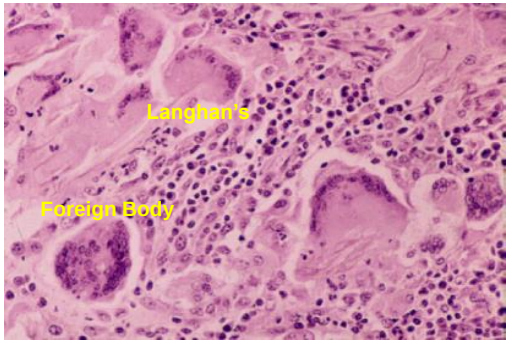

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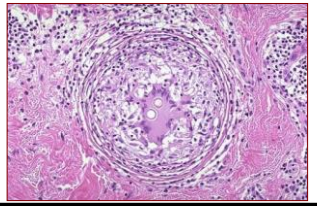
Granuloma

- Focal area (often small 0.5 -2mm) of granulomatous inflammation, which is organized and comprises of epithelioid macrophages
- Usually surrounded by a collar of lymphocytes and occasionally plasma cells
- presence of fibrous connective tissue
- Presence of Langhan's or foreign body giant cells



granulomas

There are two types of granulomas:

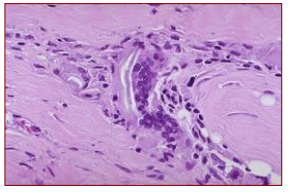
1. Foreign body granulomas

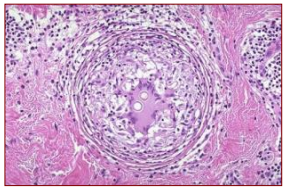
- Talc powder, Suture strings, etc

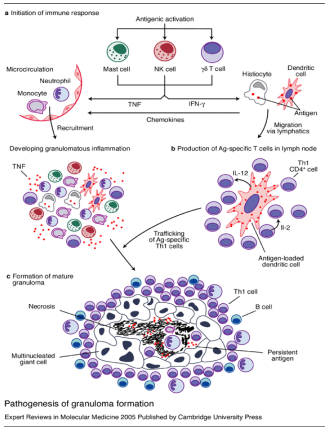
2. Immune granulomas

- Tuberculosis, Syphilis, Sarcoidosis, Brucellosis
- Cell Mediated Immunity

  accelerates development of granulomatous inflammation







Pathogenesis of granuloma formation

Expert Reviews in Molecular Medicine 2005 Published by Cambridge University Press

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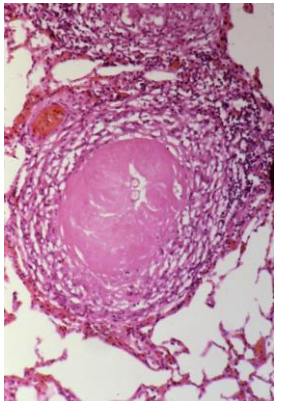
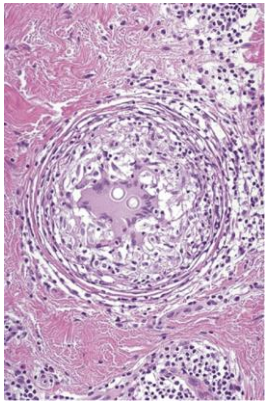


Caseating Granuloma



Non-Caseating Granuloma

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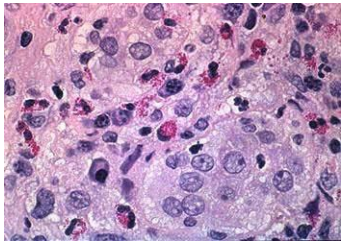
Granulomatous Inflammation
Inflammatory Cells

- Epithelioid cells (epithelioid macrophages)
- Multinucleated Giant cells
- T- lymphocytes
  - ■Neutrophils
    - Pyogranulomatous inflammation
  - ■Eosinophils
    - Eosinophilic granulomatous inflammation



Granulomatous Inflammation

Fungi
- Histoplasmosis
- Blastomycosis

Metal/Dust
- Berylliosis
- Silicosis

Foreign body
- Splinter
- Suture
- Graft material

Sarcoidosis

Bacteria
- Tuberculosis
- Leprosy

Parasites
- Schistosomiasis

Acute Vs Chronic

• Flush, Flare & Weal	• Little signs - Fibrosis,
• Acute inflammatory cells - Neutrophils	• Chronic inflammatory cells – Lymphocytes
• Vascular damage	• Neo-vascularisation
• More exudation	• No/less exudation
• Little or no fibrosis	• Prominent fibrosis

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Healing

- is the body response to injury so that normal structure and function are restored

Regeneration

- Restoration of damaged tissue by the removal of injured cells and replacement with cells of the same (identical) type.
  - Presence of stem cells for renewal
  - tissue cells that are capable to divide in response to growth factors
  - Intact tissue scaffold

Repair

- when there is tissue loss - healing by proliferation of connective tissue resulting in fibrosis and scar formation

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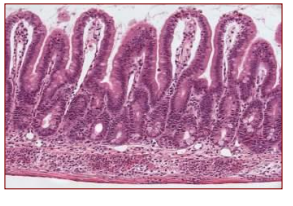
Tissue Repair Mechanisms
Cell Renewal

- Whether regeneration or fibrosis ?

  is dependent upon the regenerative ability of the cells/organ involved.
- Capability of cells to replicate
- Stem cells
- Tissue Type
  - Labile
  - Stable
  - Permanent

Labile Cells



- Continuously dividing
- Regenerate from a population of stem cells after injury
- >1.5% cells in mitoses
- Examples

  - Cells in contact with environment-epidermis, alimentary tract, respiratory tract, urinary tract, vagina, cervix, uterus
  - Lymphoid Cells – lymph node, spleen
  - Haematopoietic Cells

Stable Cells

- Low level of replication
  < 1.5% of normal adult cells are in mitoses
- Can respond to stimuli
- Examples
  1. organs- liver, kidney,
  pancreas, adrenals, thyroid
  - Need intact basement membrane eg. renal tubules can regenerate- Glomeruli do not
  - 2. vascular endothelium
  - 3. bone
  - 4. cartilage cells
  - 5. Mesenchymal cells
    - Smooth muscle cells
    - Fibroblasts

Permanent Cells

- Cells don't divide
- No regenerative ability
- 0.0% cells are in mitoses
- Examples
  - Neurons
  - Lens epithelium
  - Cardiac myocytes
  - Skeletal muscle cells