SNS COLLEGE OF ALLIED HEALTH SCIENCE

Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai

DEPARTMENT OF CARDIAC TECHNOLOGY

COURSE NAME : PATHOLOGY

UNIT : 1

TOPIC : CHRONIC INFLAMMATION

FACULTY NAME : Ms. HARSHITHA S

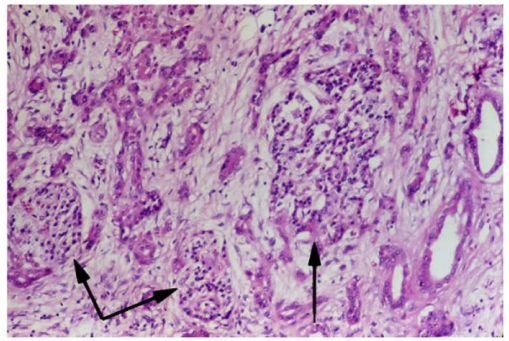
Introduction

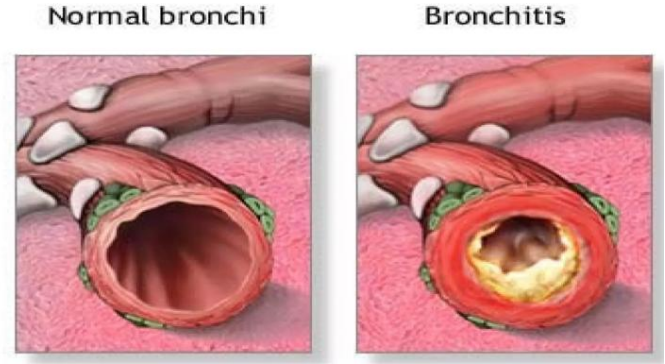
Chronic inflammation is a **prolonged inflammatory response** that occurs when:

- The acute response fails to eliminate the causative agent
- The injurious stimulus persists over time
- Autoimmune processes or repeated injuries occur

It is characterized by **simultaneous inflammation, tissue destruction, and repair**.

Chronic Inflammation
(Tissue destruction-Pancreas)

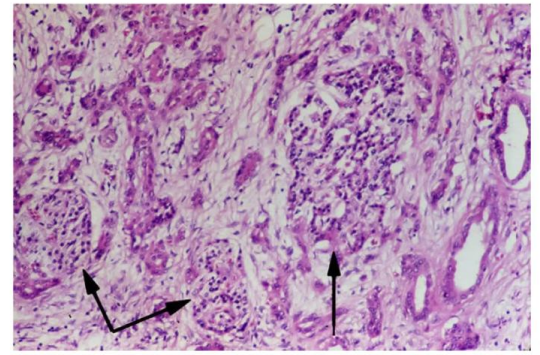




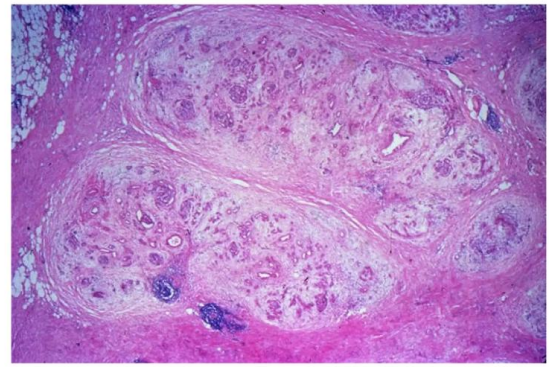
Features of Chronic Inflammation

- **Duration:** Weeks to months or years
- **Cell types involved:** Predominantly **mononuclear cells** (macrophages, lymphocytes, plasma cells)
- **Tissue destruction:** Due to persistent injurious agents or immune response
- **Attempt at healing:** Occurs simultaneously through **fibrosis** and **angiogenesis**

Chronic Inflammation
(Tissue destruction-Pancreas)



Chronic Inflammation
(Fibrosis-pancreas)



Causes of Inflammation

1. **Persistent infections** – e.g., tuberculosis, viral hepatitis
2. **Autoimmune diseases** – e.g., rheumatoid arthritis, lupus
3. **Prolonged exposure to toxic agents**
   - Endogenous (atherosclerosis)
   - Exogenous (silica, asbestos)
4. **Unresolved acute inflammation**

Chronic Gastritis

Chronic Inflammation
(Rheumatoid arthritis)

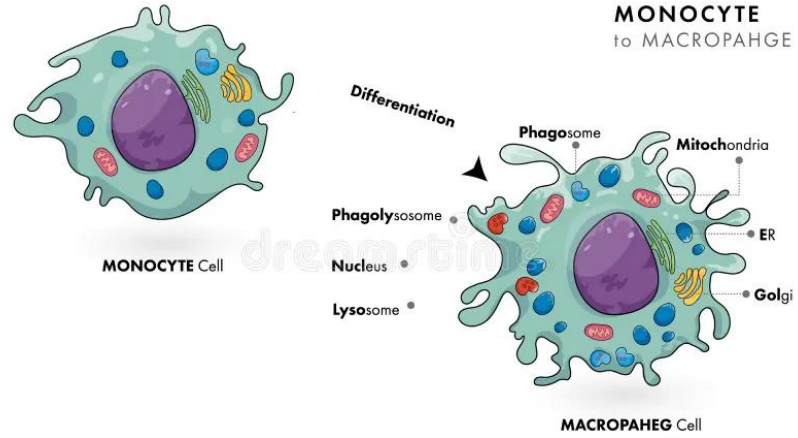
Silicosis

Lesions of Atherosclerosis in Aorta

Role of Macrophages

Origin:

- Derived from **monocytes** in blood
- Become **macrophages** when they enter tissues



Functions:

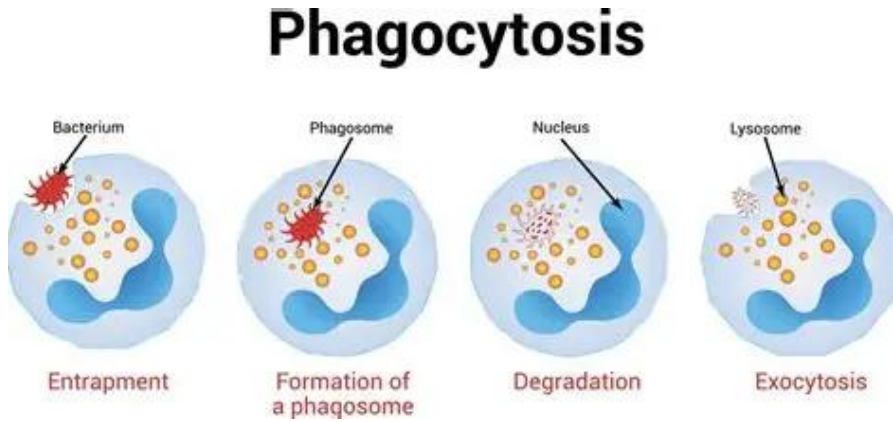
Phagocytosis of pathogens and dead tissue

Antigen presentation to T-cells

- Release of cytokines (IL-1, TNF-α, IL-6)

Orchestrate both tissue destruction and repair (fibrosis)

Stimulate fibroblasts and angiogenesis

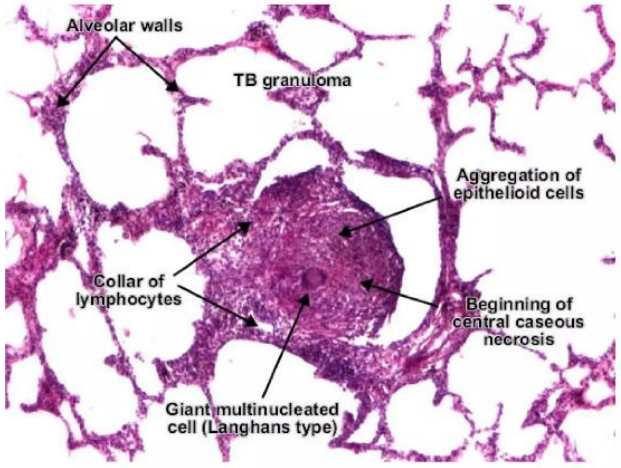


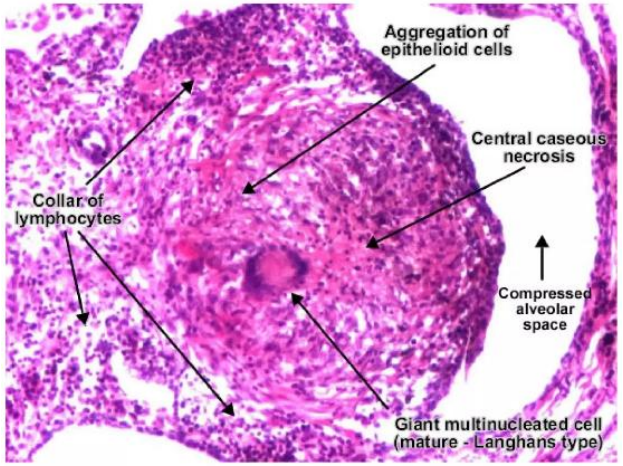
Other Key Cells

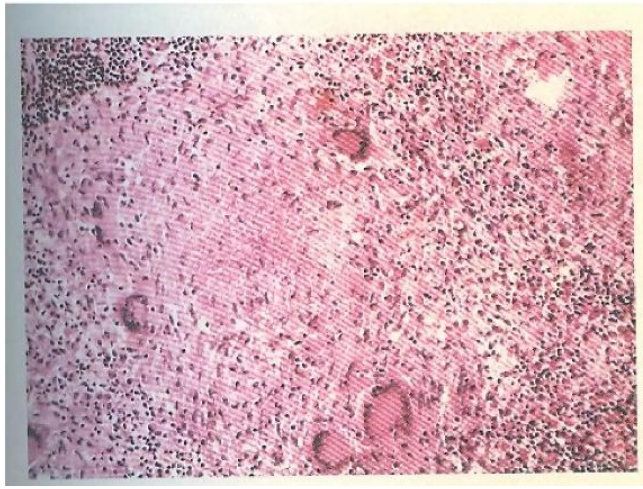
Cell Type	Role
Lymphocytes	Activate macrophages via IFN-γ, regulate immune response
Plasma Cells	Produce antibodies
Eosinophils	Involved in parasitic infections, allergic inflammation
Mast Cells	Release histamine; play a role in both acute and chronic phases
Fibroblasts	Collagen synthesis → fibrosis and scarring

Granulomatous Inflammation

Definition: A **distinct type of chronic inflammation** characterized by the formation of **granulomas** - aggregates of **epithelioid macrophages**, often surrounded by lymphocytes.







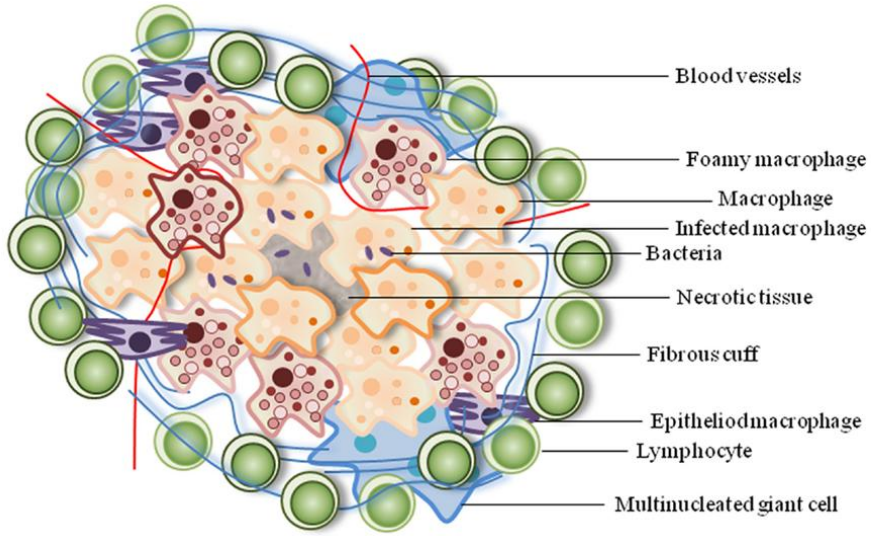
Granulomatous Inflammation

Features:

- **Epithelioid cells**: Activated macrophages with pink granular cytoplasm
- **Multinucleated giant cells**: Fusion of epithelioid cells
- May have **central necrosis** (caseating in TB)

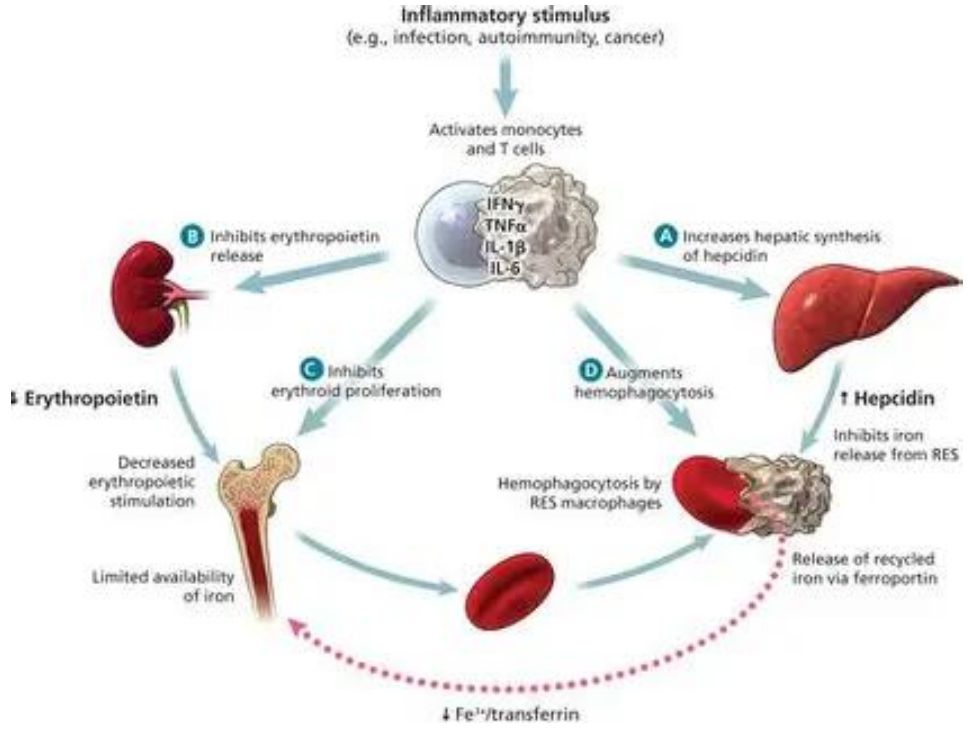
Examples:

- **Tuberculosis –** Caseating granulomas
- **Sarcoidosis –** Non-caseating granulomas
- **Leprosy, Crohn's disease**, foreign body granulomas



Systemic Effects

- **Fever –** via IL-1 and TNF acting on hypothalamus
- **Acute-phase proteins –** CRP, fibrinogen, serum amyloid A
- **Leucocytosis or leukopenia**
- **Weight loss –** due to cytokines (cachexia in chronic disease)
- **Anaemia of chronic disease**



Clinical Examples & Summary

Condition	Cause	Type
Tuberculosis	Mycobacterium tuberculosis	Granulomatous
Rheumatoid arthritis	Autoimmune	Non-granulomatous
Ulcerative colitis	Chronic inflammation of colon	Mixed
Chronic viral hepatitis	HBV, HCV	Chronic persistent inflammation
Silicosis	Inhalation of silica	Fibrosing granulomatous

Reference

1. Kumar, V., Abbas, A.K., & Aster, J.C. (2021). *Robbins and Cotran Pathologic Basis of Disease* (10th ed.). Elsevier.
2. MedlinePlus. (2023). **Chronic Inflammation**. U.S. National Library of Medicine. Available at: https://medlineplus.gov/inflammation.html

THANK YOU