HM/CH-1/L-7

MORPHOLOGY OF CELL INJURY

MORPHOLOGIC FORMS OF CELL INJURY

MECHANISMS

1. Reversible cell injury
2. Deranged cell metabolism
3. Irreversible cell injury
4. Programmed cell death
5. Residual effects
6. After-effects

NOMENCLATURE

1. Retrogressive changes(degenerations)
2. Intracellular accumulations
3. Cell death-necrosis
4. Apoptosis
5. Subcellular alterations
6. Gangrene, pathologic calcification

DERANGED METABOLISM: INTRACELLULAR ACCUMULATION

- *Accumulation of constituents of normal cell metabolism:*

  fat, proteins, CH
- *Accumulation of abnormal substances:*

  storage diseases
- *Accumulation of pigments:* endogenous, exogenous

Web Table 3.3: Pigments of the Body.

A. ENDOGENOUS PIGMENTS

1. Melanin
2. Melanin-like pigment
   a. Alkaptonuria
   b. Dubin-Johnson syndrome
3. Haemoprotein-derived pigments
   i) Haemosiderin
   ii) Acid haematin (Haemozoin)
   c. Bilirubin
   d. Porphyrins
4. Lipofuscin (Wear and tear pigment)

B. EXOGENOUS PIGMENTS

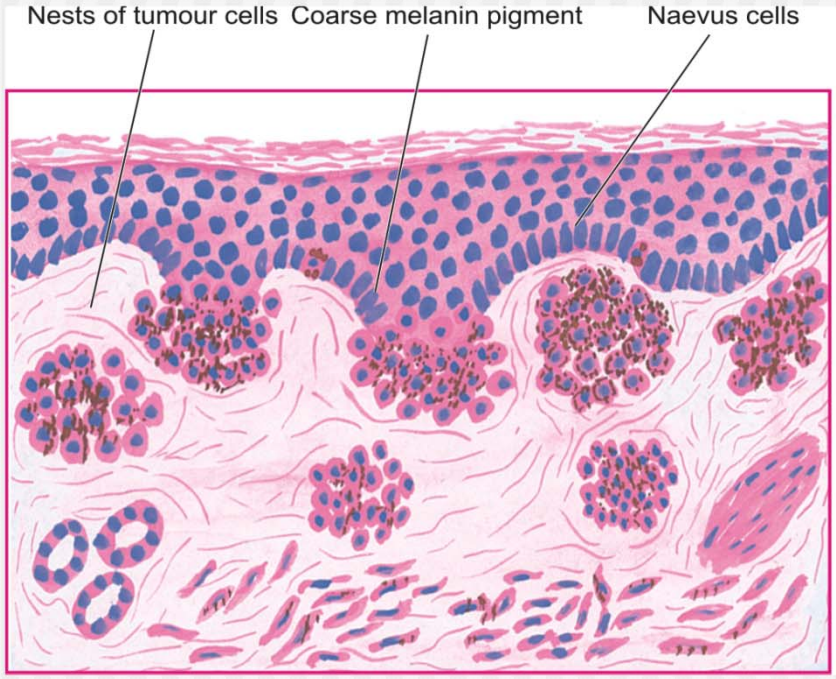
1. Inhaled pigments
2. Ingested pigments
3. Injected pigments (Tattooing)

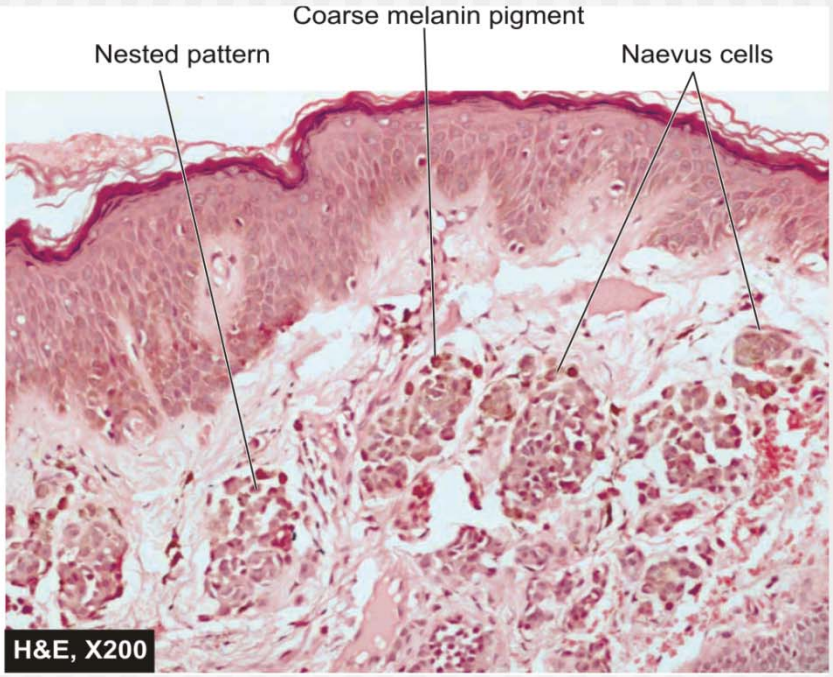
ENDOGENOUS PIGMENTS: Melanin

- Generalised hyperpig:
  -Addison's disease
  -Chloasma
  -Ch arsenic poisoning
- Focal hyperpig:
  -Café-au-lait spots
  -Peutz-Jeghers syndrome
  -Melanosis coli
  -Melanotic tumours
  -Lentigo
  -Dermatopathic LN

- Generalised hypopig:
  -Albinism
- Localised hypopig:
  -Leucoderma
  -Vitiligo
  -Acquired causes

Melanin in intradermal naevus





Melanin-like pigments:

Alkaptonuria

- Autosomal recessive
- Deficiency of oxidase enzyme required for breakdown of HA
- Accumulation of HA in tissues (ochronosis)
- Alkaptonuria (homogentisic aciduria)

Dubin-Johnson syndrome

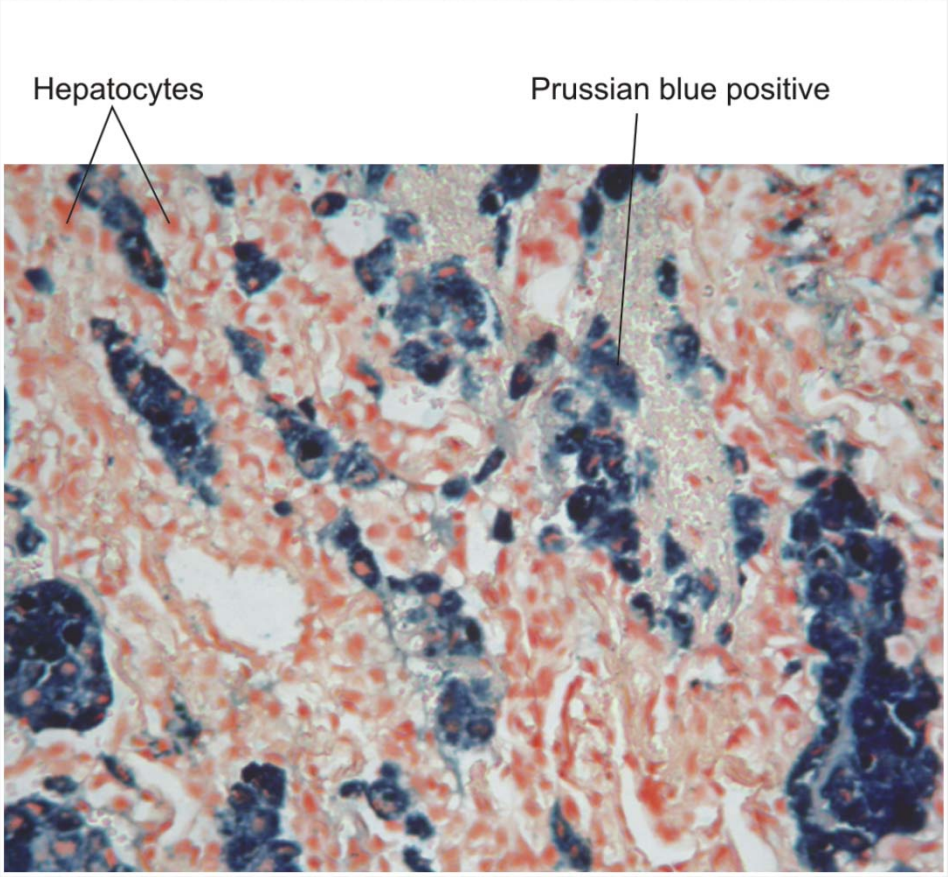
- Automsomal recessive from of hereditary conj hyperbil.

Haemoprotein-derived pigments

1.Haemosiderin
2. Acid haematin (haemozoin)
3. Bilirubin
4. Porphyrins

Haemosiderin

- Ferritin
- Haemosiderin (Haemosiderosis)



HAEMOSIDEROSIS

LOCALISED

- In local tissues (Macrophages, fibroblasts, endothelial and alveolar cells)

Examples:

i. Haemorrhage in tissues
ii. Black eye
iii. Brown induration lung
iv. Infarction

GENERALISED (SYSTEMIC)

- Parenchymal deposits (Liver, Pancreas, Kidney, Heart, Skin)
- RE cell deposits (Liver, Spleen, Bone marrow)

Examples:

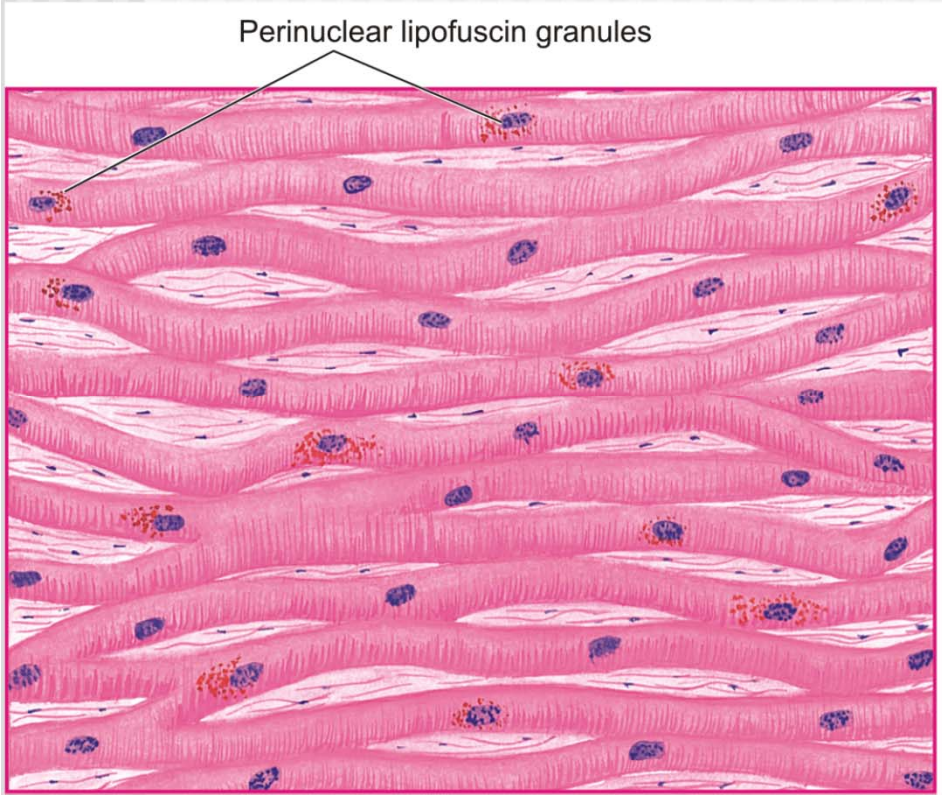
i. Acquired haemosiderosis (Chronic haemolytic disorders, blood transfusion, parenteral administration of iron)
ii. Hereditary (Idiopathic) haemochromatosis (Increased absorption, genetic defect)
iii. Excessive dietary intake (Bantu's disease)

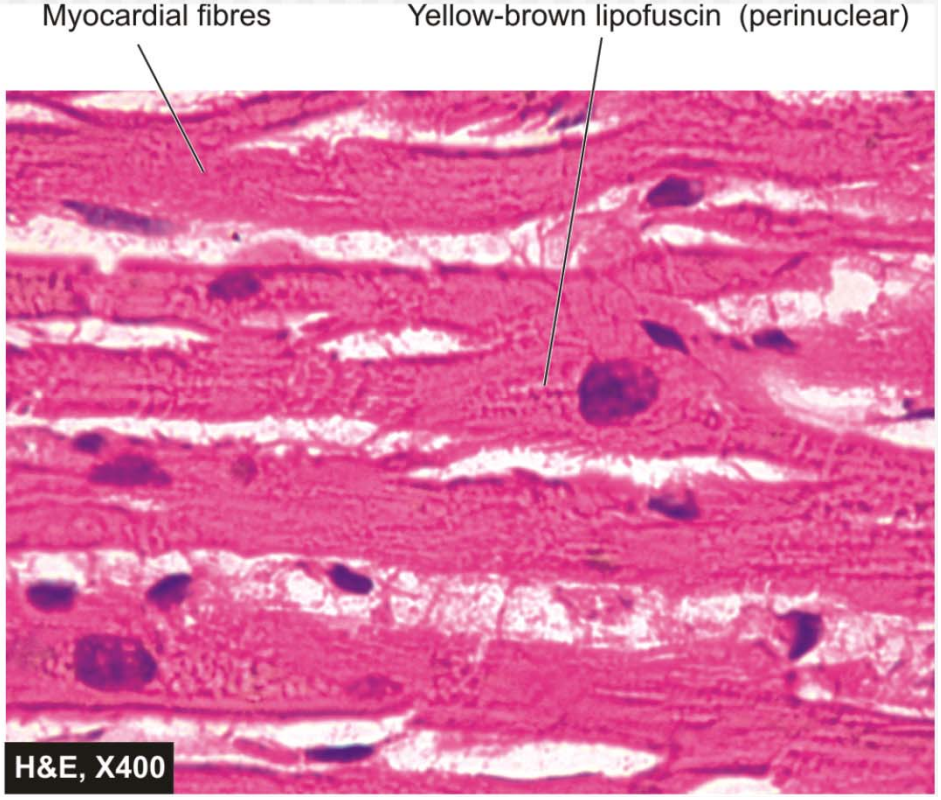
Other haemoprotein-derived pigments

2. Acid haematin (haemozoin)
3. Bilirubin
   -Conj & unconj hyperbilirubinaemia (jaundice)
4. Porphyrins
   -Erythropoietic porphyria: defective haem synthesis in red cells
   -Hepatic porphyria: normal erythroid precursors but a defect in synthesis of haem in liver

Lipofuscin (wear and tear pigment)

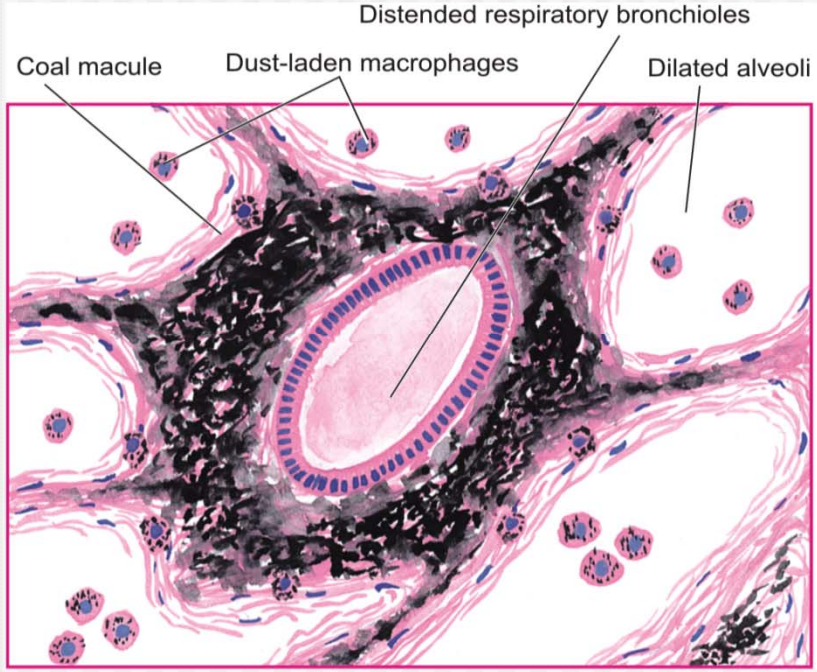
- LM
- EM

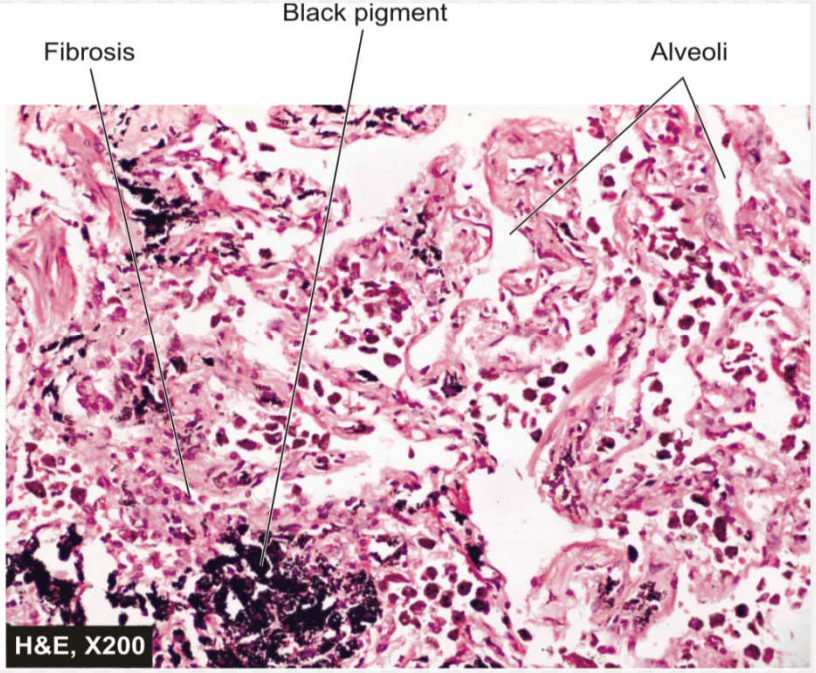




EXOGENOUS PIGMENTS

- Inhaled pigments: various dusts





- Ingested pigments: argyria, ch lead poisoning, carotinaemia
- Injected pigments (tattooing): India ink, carbon