

Hemodynamic disorders I.

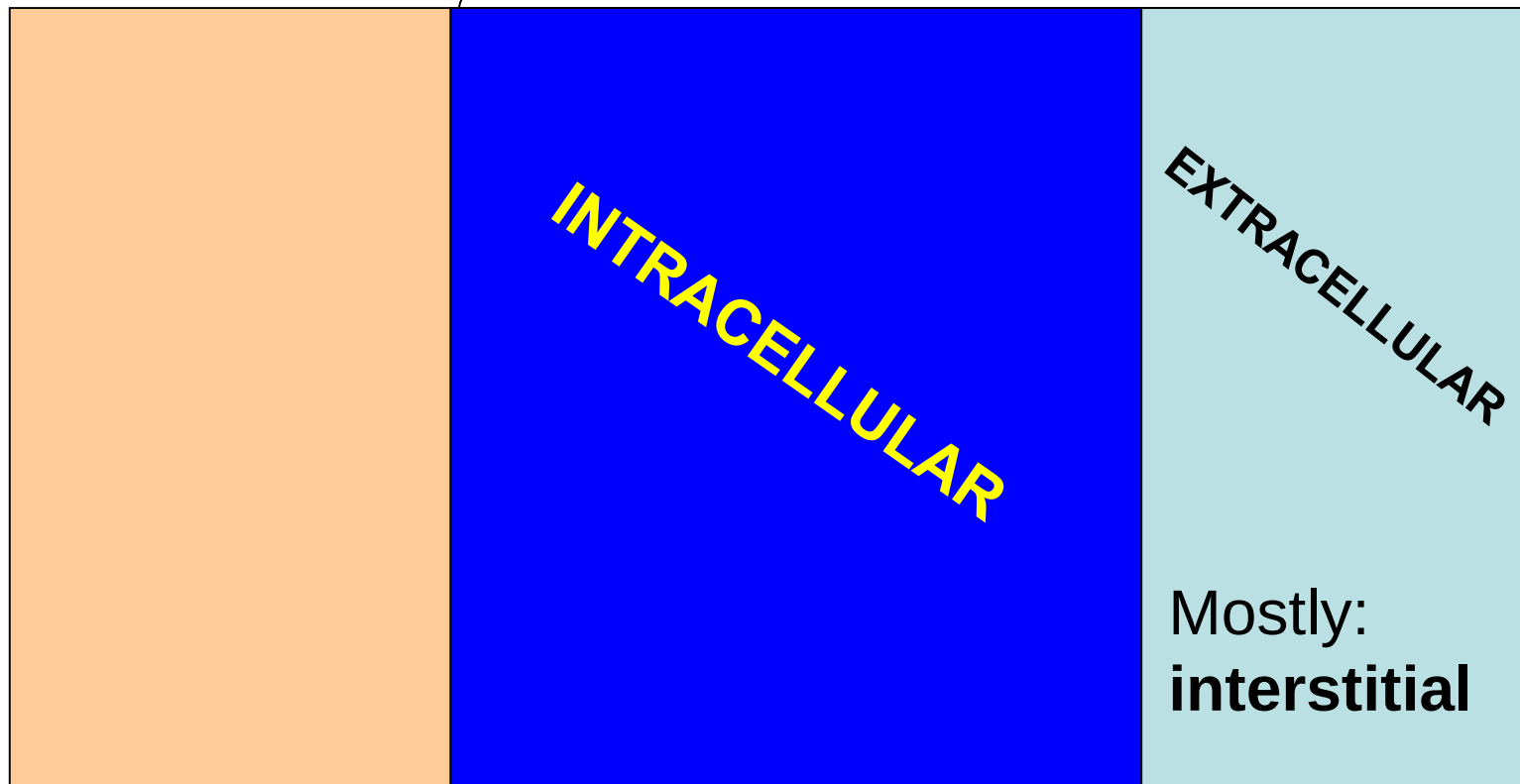
Edema, congestion

Edema: increased fluid content in the interstitium (transudate or exudate)

Transudate: protein content < 3 mg/ml

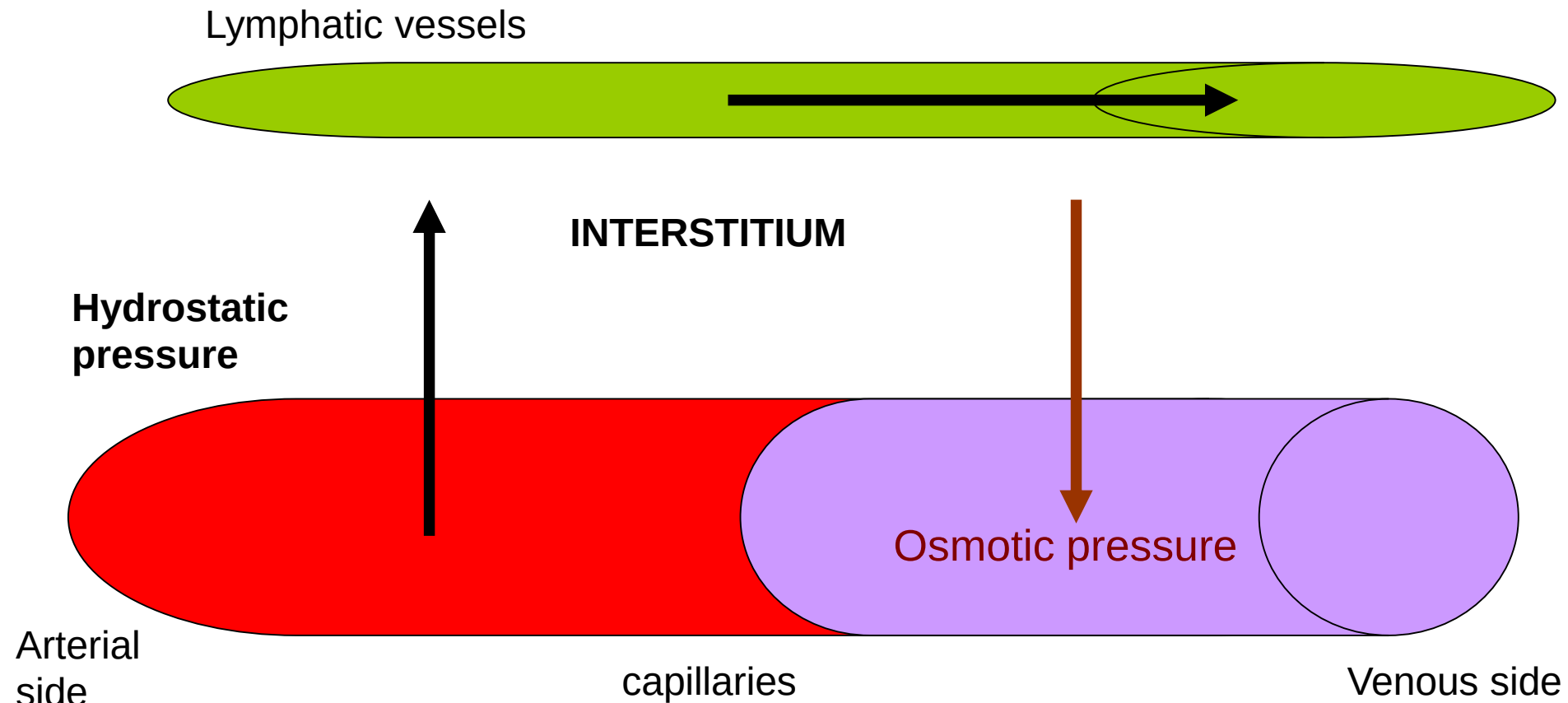
Exudate: protein content > 3 mg/ml

60 % of the body mass is water



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Edema formation



Edema formation - causes

(Inflammation:

- acute/chronic) later...

-inflammation (lymphangitis)

-tumor

lymphoedema

Lymphatic vessels



INTERSTITIUM

Hydrostatic pressure



- nephrosis-syndrome

- liver failure

- malnutrition

Osmotic pressure
albumin



Venous side

-local: deep vein thrombosis

-generalized: heart failure + renin-AT/ fluid retention

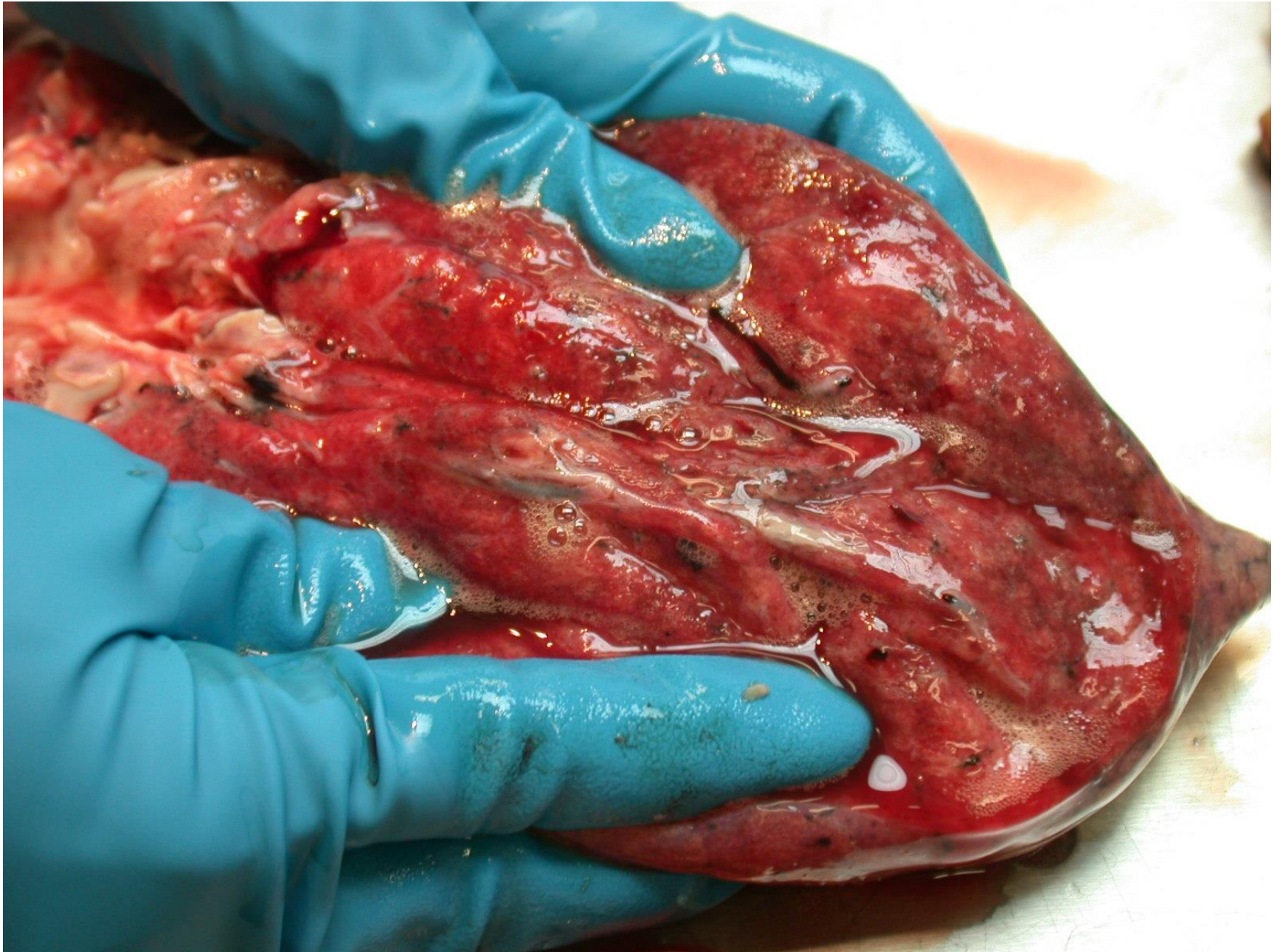
- acute renal failure/salt and water retention

Causes of lung edema

(oedema pulmonis)

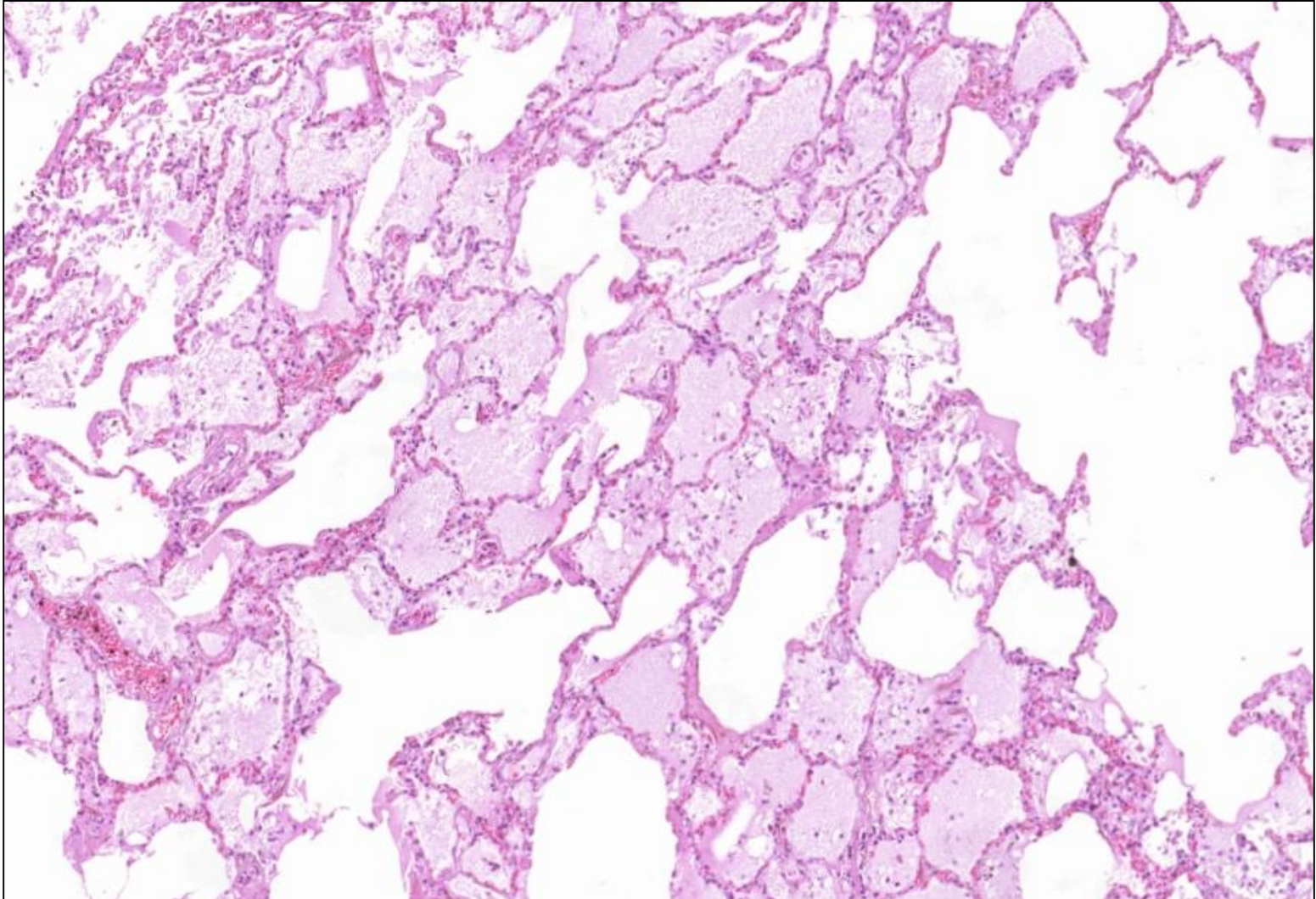
- Cardiogenic: left heart failure: $p_{\text{hydrostatic}}$ ↑
- Non-cardiogenic: vascular permeability ↑
 - Toxic damage
 - Renal failure (uraemia, hypoproteinaemia)
 - Hypoxia
 - Fluid and electrolyte management disorders (iatrogenic: infusion mismanagement)

Oedema pulmonis



Oedema pulmonis

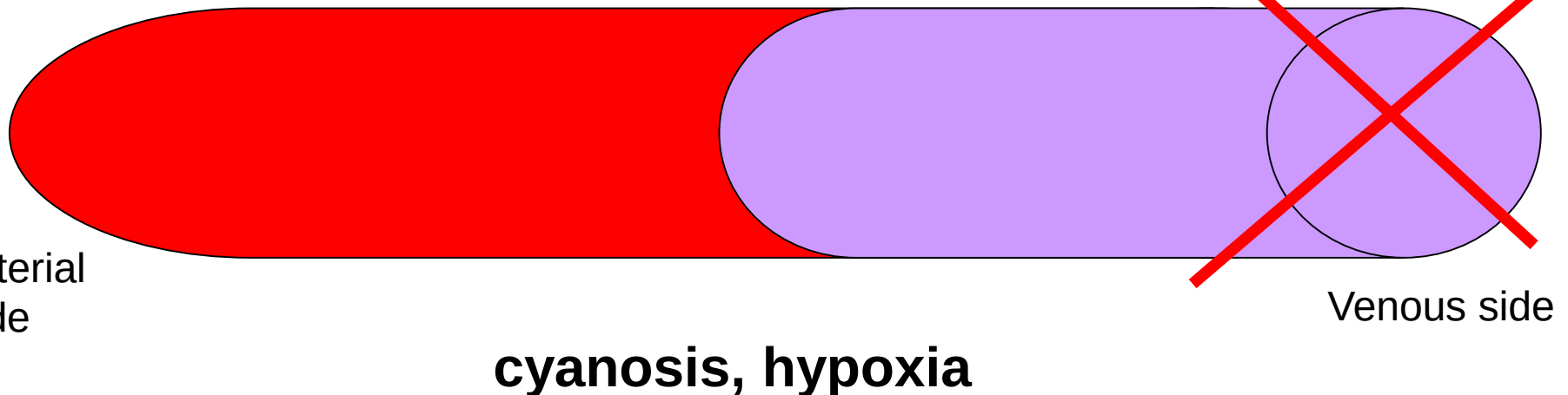
- **Microscopically**
 - eosinophilic transudate in the alveoli



Congestion

= passive hyperaemia

- systemic: heart failure
- local: venous occlusion
- acute
- chronic -> leads to:
parenchymatous degeneration / necrosis



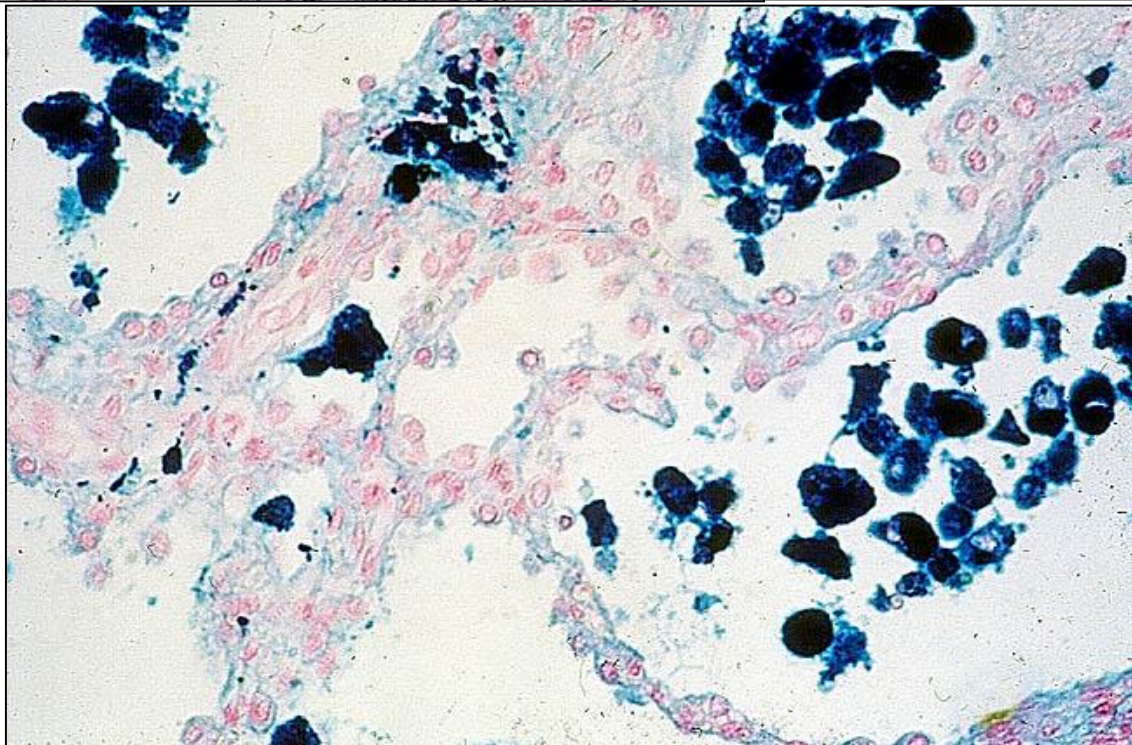
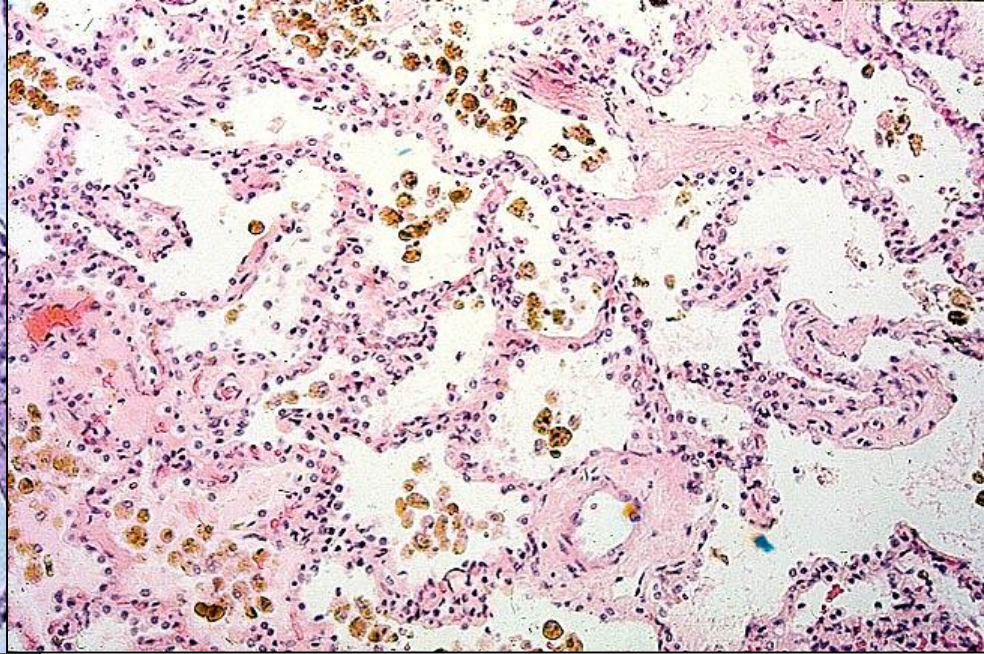
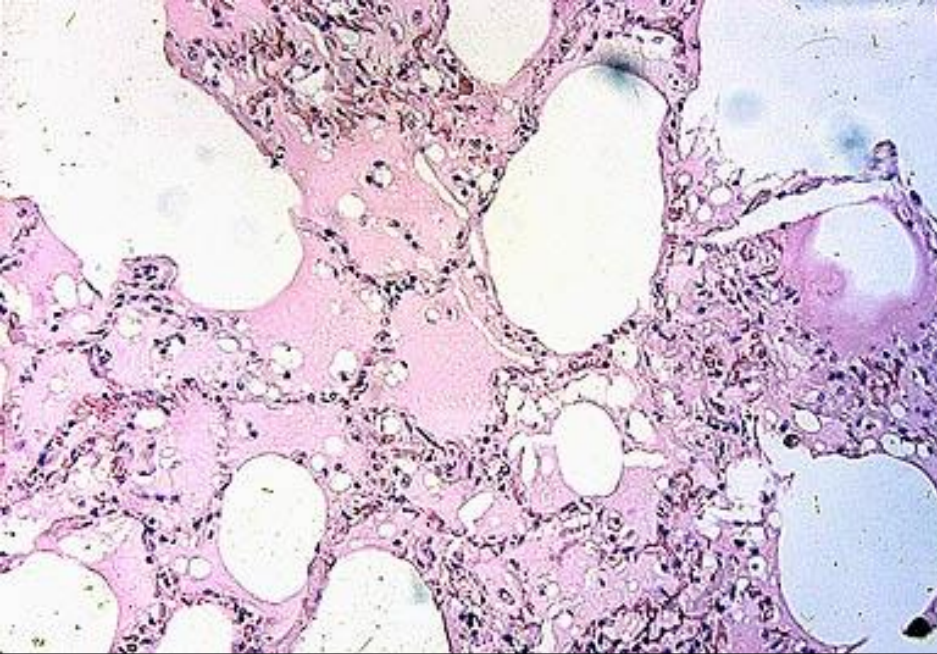
Lung congestion

- Acute
 - Lungs are heavy, firm elastic
 - Alveolar capillaries are engorged with blood
- Chronic:
 - firm, brownish: induratio brunea pulmonis
 - fibrotic septa
 - hemosiderin laden macrophages („heart failure cells”)

CAUSE: left heart failure

Induratio brunea pulmonis



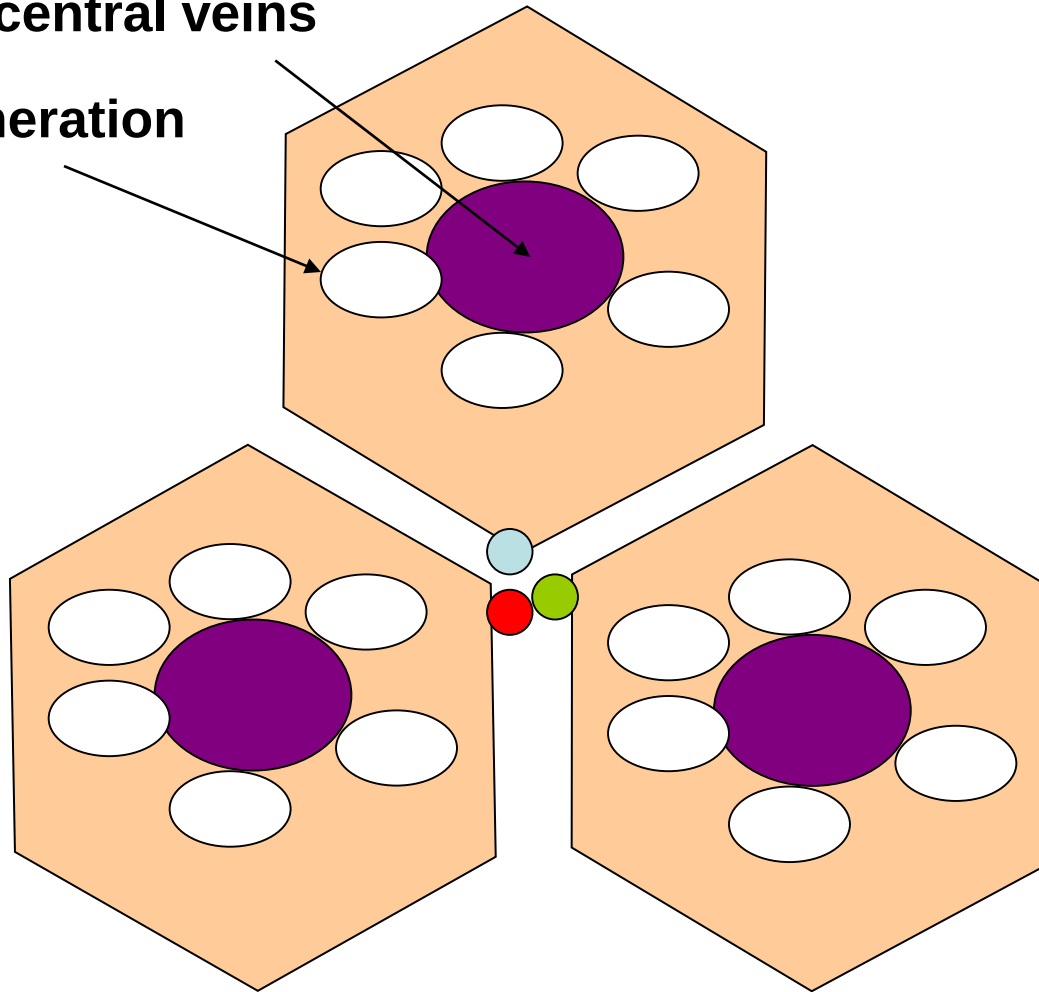


Prussian-blue
reaction

Liver congestion

Chronic: nutmeg liver (hepar moschatum)

- dilation of central veins
- fatty degeneration



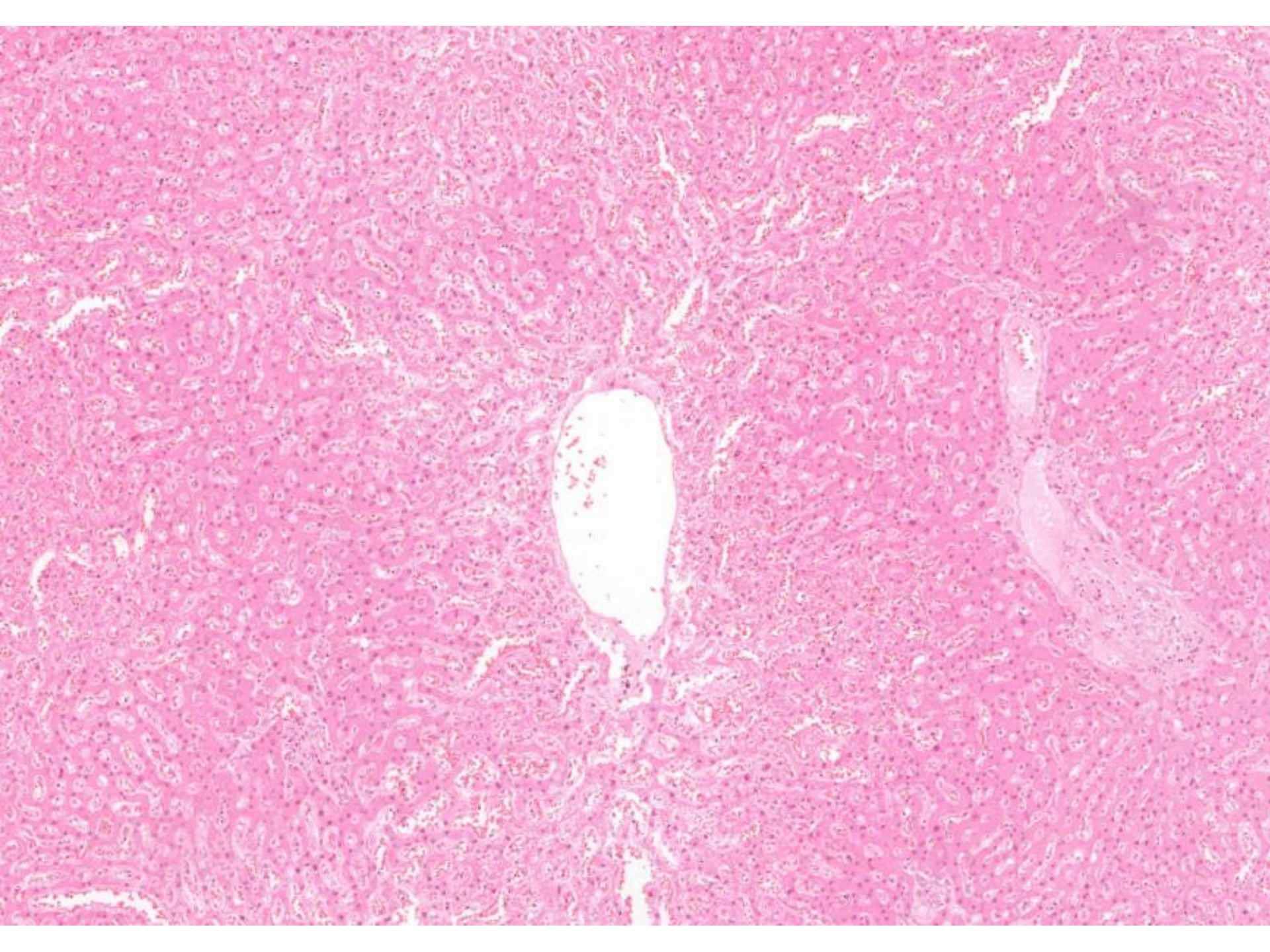


Boldog Kukta

boldogkukta.blogspot.com

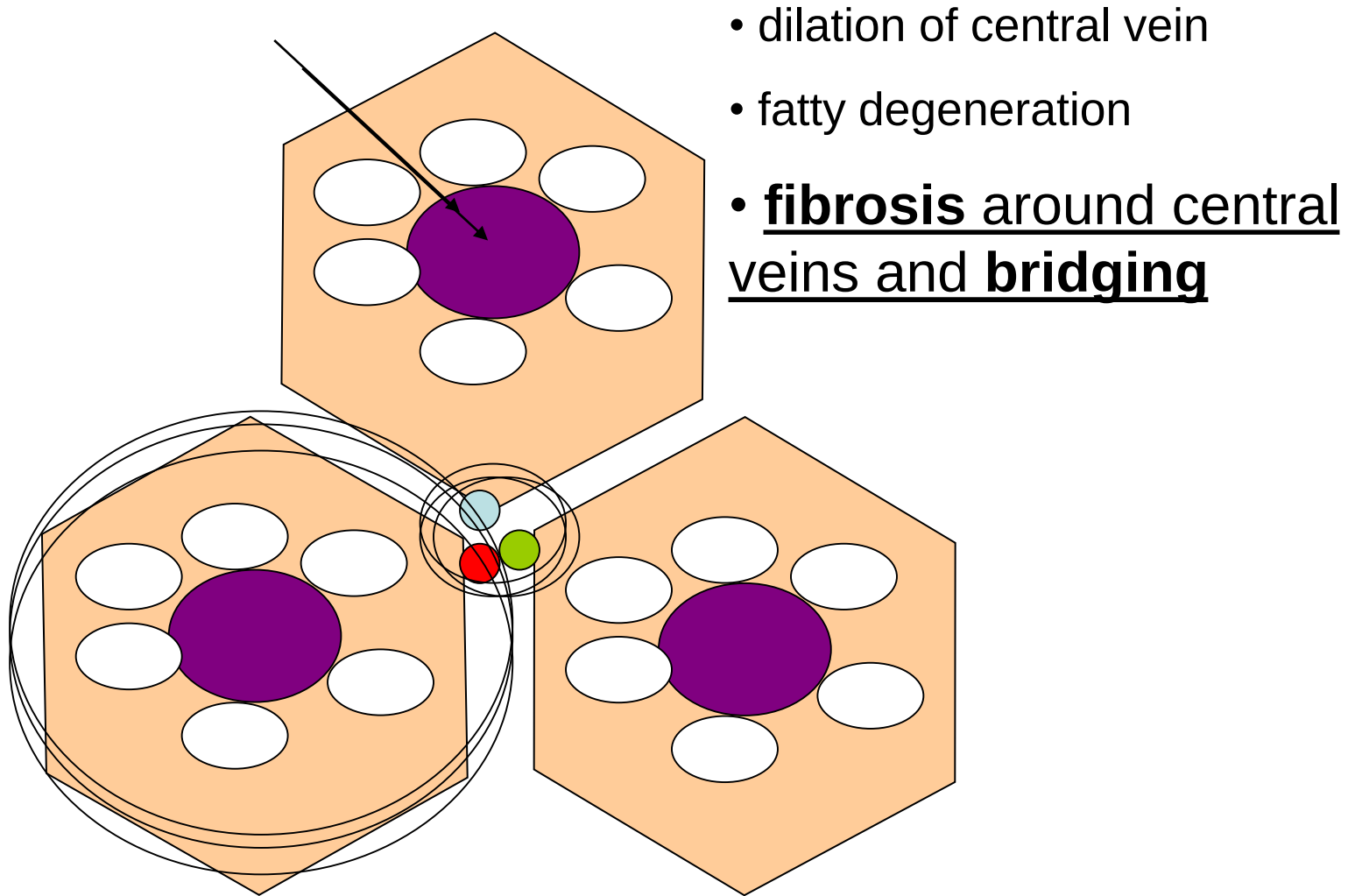
Hepar moschatum



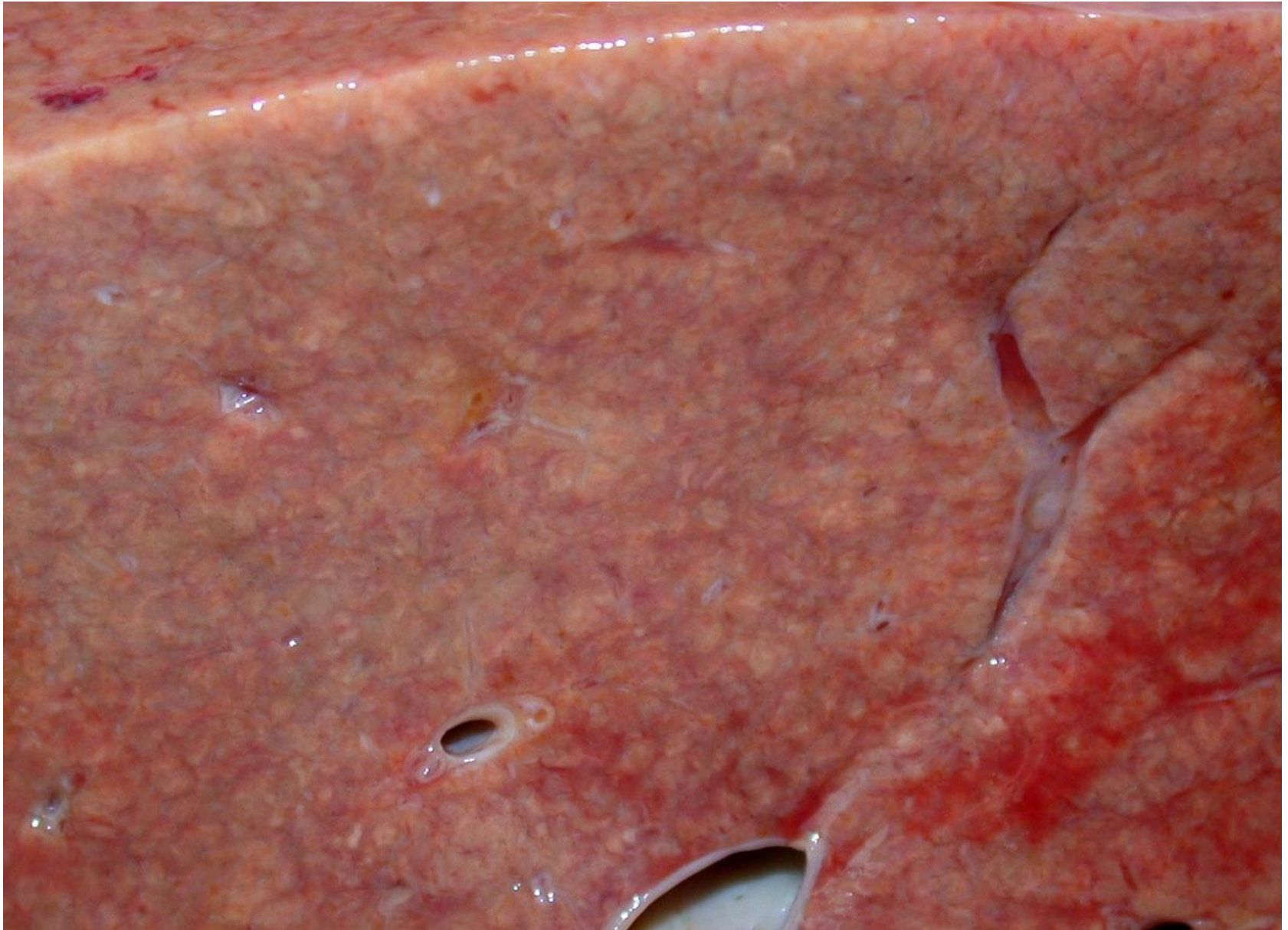


Liver congestion

Chronic complication of congestion : liver fibrosis



Fibrosis hepatis



Fibrosis hepatis

central vein

portal triad

