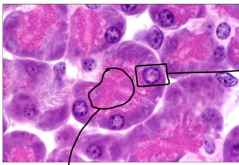


Histology - Stains

* Hematoxylin and eosin \Rightarrow the most basic type of stains

① 

Hematoxylin behaves like a basic dye
it stains basophilic tissue components
like \rightarrow DNA [nucleus]
 \rightarrow RNA
 \rightarrow glycosaminoglycans

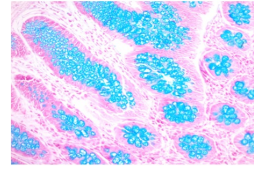
Eosin, an acidic dye
staining acidophilic tissue
components with **Pink**
like \rightarrow mitochondria
 \rightarrow secretory granules
 \rightarrow collagen

* Hematoxylin is basic
and it \leftrightarrow reacts with negatively charged tissue components
 \downarrow
staining these components in **blue**

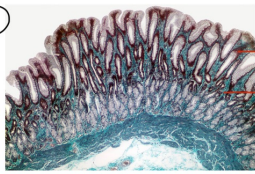
② 

The cytoplasm (Pink)
eosin
The nucleus (blue)
Hematoxylin

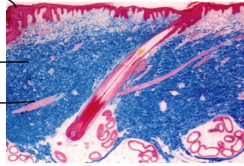
* Alcian blue \Rightarrow used to stain \rightarrow epithelial mucin
 \rightarrow connective tissue
 \rightarrow goblet cells
 \rightarrow cartilage



* Trichrome (Masson trichrome)

① 

nuclei (dark brown)
connective tissue (blue)
* cytoplasm will be stained in pink (but not clear in this image)

② 

nuclei (dark brown)
connective tissue (blue)
cytoplasm (pink)

- it uses 3 colors to emphasize support fibers

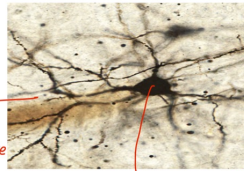
* The Periodic acid-Schiff (PAS)



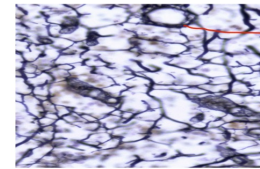
the nucleus in bluish
the cytoplasm in pinkish
more purple (magenta)
than hematoxylin and eosin

it utilizes the hexose rings of Polysaccharides and other carbohydrate-rich tissue structures
 \Rightarrow these macromolecules are stained in **Purple (magenta)**

* Silver stain (metal impregnation) \Rightarrow to visualize certain ECM fibers and specific cellular elements of the nervous tissue

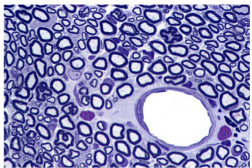


it looks like a net because of the structure of nerves
nerve cell (cell body)

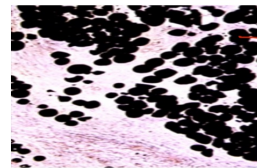


reticular fibres
 \leftrightarrow collagen type III

* Toluidine blue \Rightarrow A basic dye

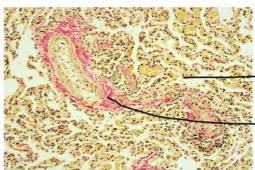


* Sudan black \Rightarrow lipid-soluble dyes stain lipids



lipids
* in other types of staining like H&E lipids are removed in tissue preparation in the steps that remove lipids / so sudan black helps in observing them

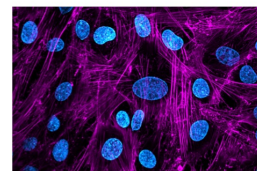
* Van Gieson method

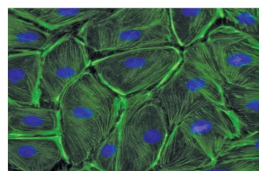


muscle (yellow)
collagen (pink)

* used to view muscles and collagen

* Immunostaining \Rightarrow with a black background





* what we see is the color of fluorescent labels on antibodies linking with antigens (structures we want to see)

* Phase contrast microscope specimen



* TEM

\rightarrow a 2d image



* SEM

\rightarrow a 3d image

