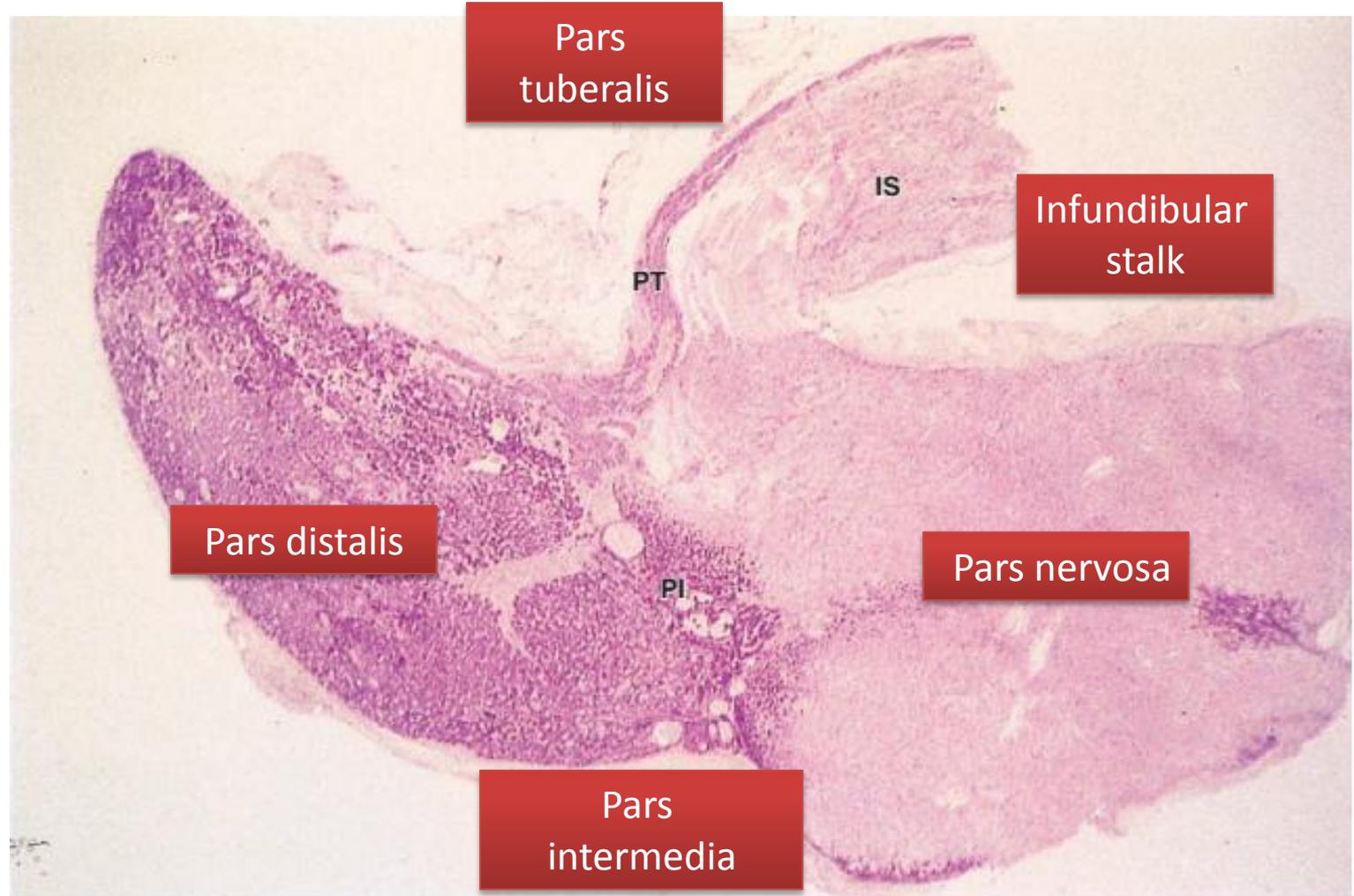


Histology of Endocrine Glands

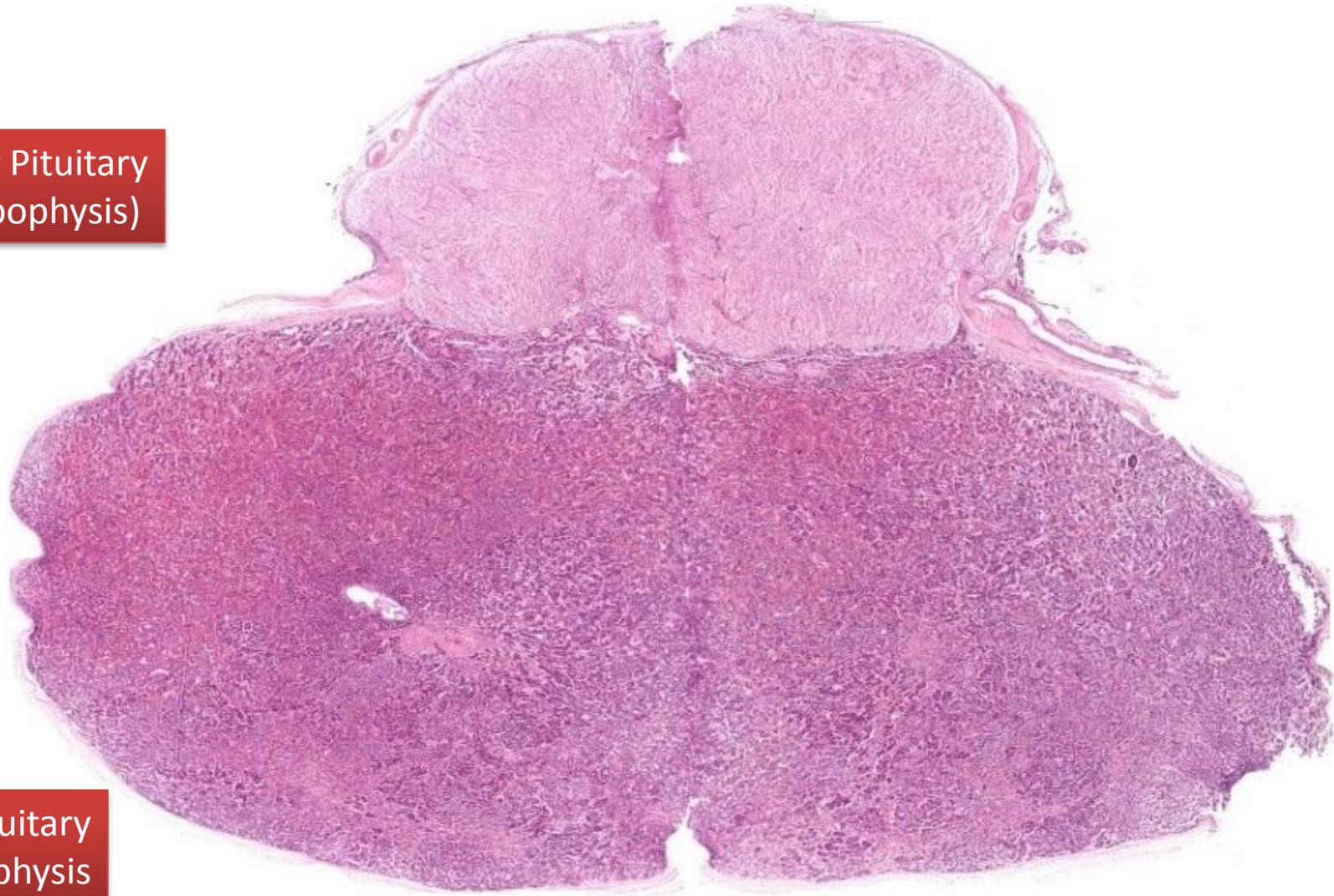
muna.salameh@bau.edu.jo

Pituitary Gland



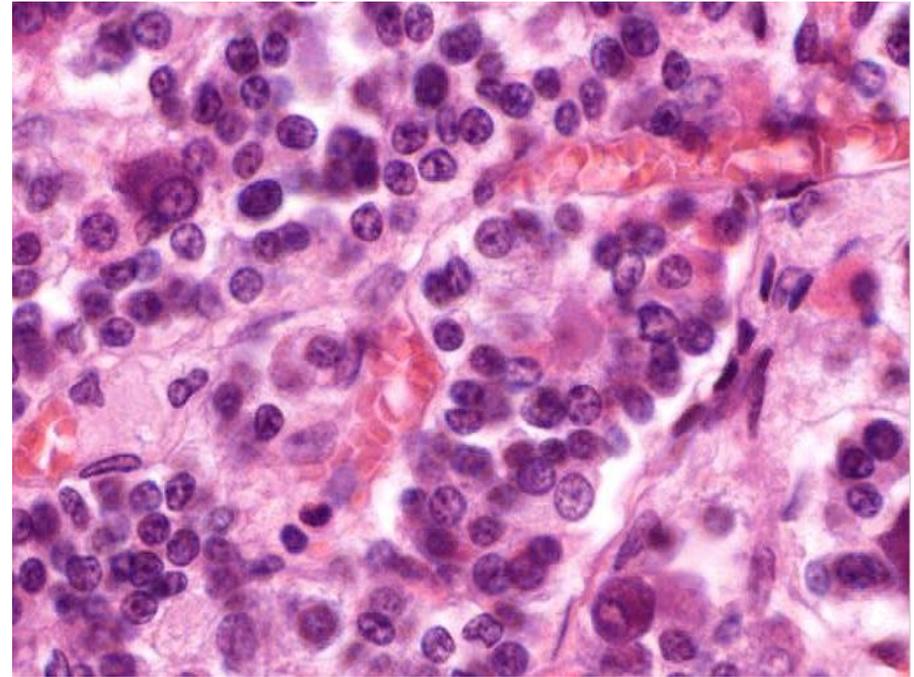
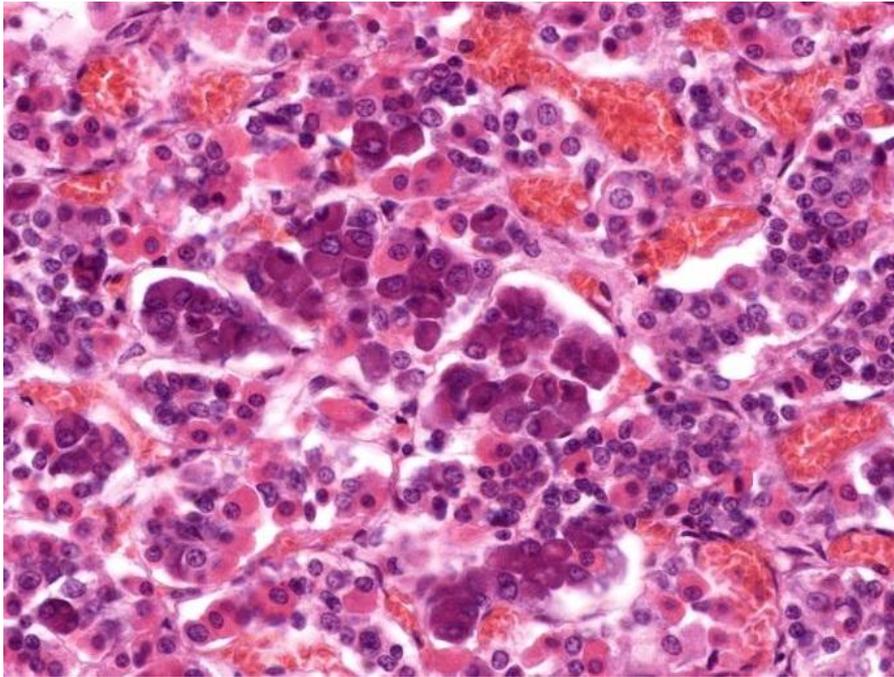
Pituitary Gland

Posterior Pituitary
(Neurohypophysis)



Anterior Pituitary
Adenohypophysis

Cells of Pars Distalis



Chromophils:
stain with H&E and secrete hormones

Chromophobes:
stain poorly with H&E and do not secrete hormones

Chromophils of Pars Distalis

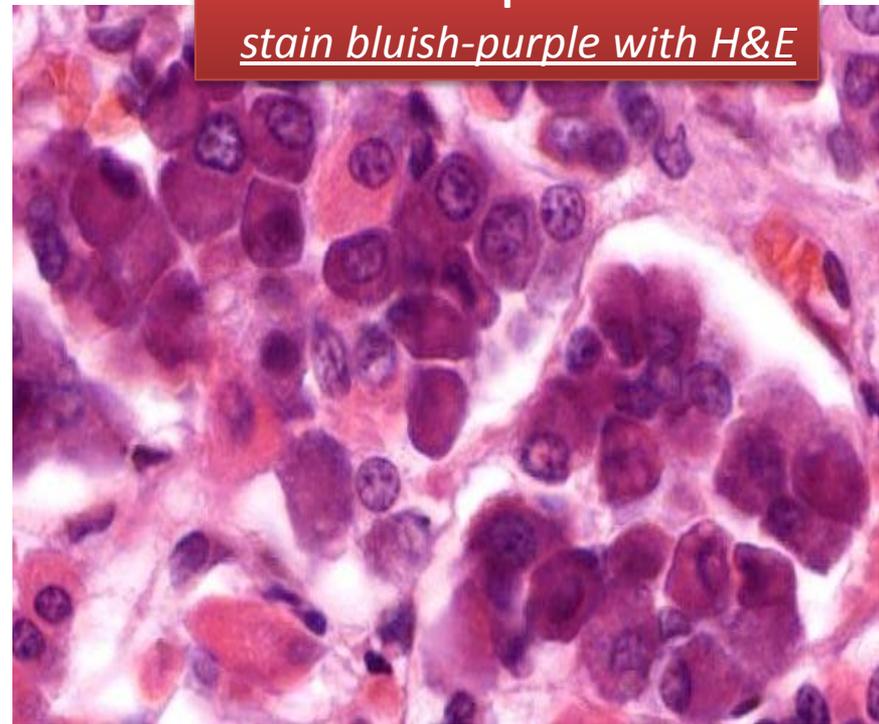
Acidophils:

stain pinkish-red with H&E



Basophils:

stain bluish-purple with H&E

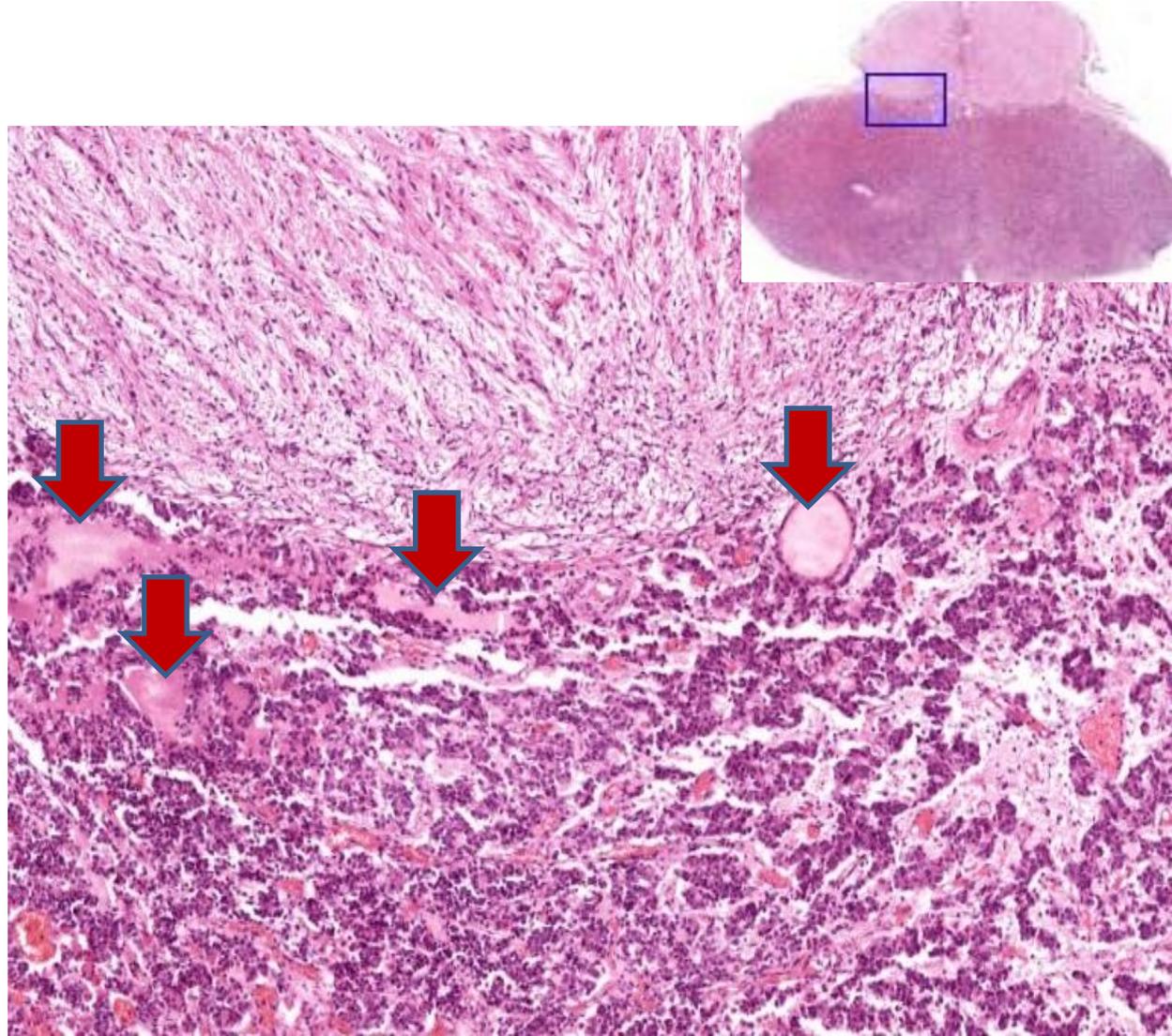


Somatotrophs - growth hormone (GH).
Lactotrophs - prolactin.

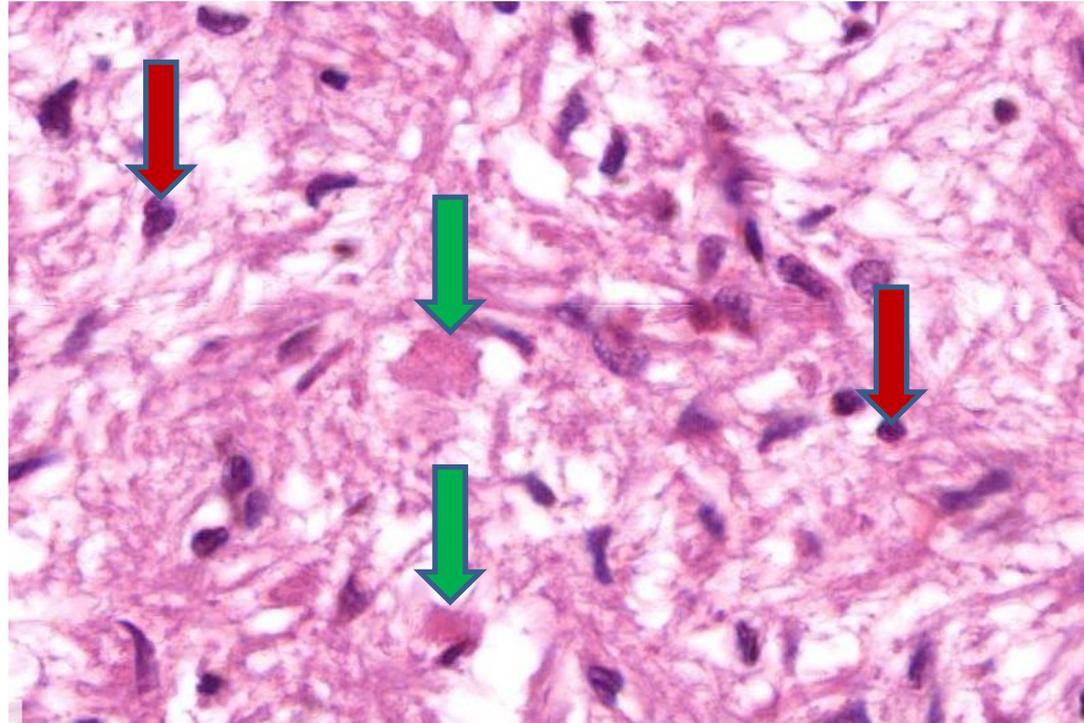
Thyrotrophs - TSH.
Corticotrophs - adrenocortical
trophic hormone -ACTH.
Gonadotrophs - FSH and LH

Pars Intermedia

- ✓ Thin remnant of hypophyseal (Rathke) pouch (<2%) at interface between the anterior and posterior lobes
- ✓ Contains numerous colloid (protein)-filled cysts (**Rathke's cysts**)
- ✓ **Basophils** – Melanocyte Stimulating Hormones (MSH)



Pars Nervosa

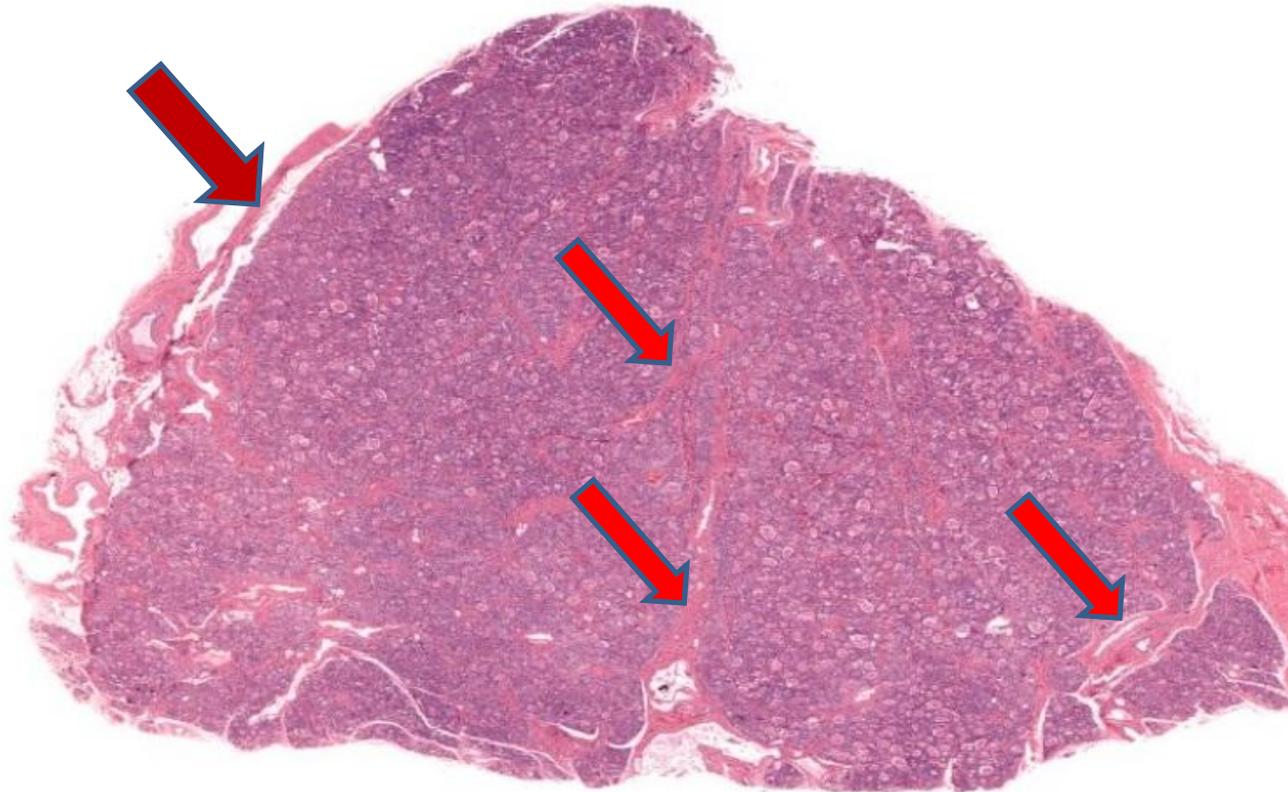


✓ Axons from the hypothalamus that release hormones into the capillaries of the pars nervosa.

✓ **Pituicytes:** most nuclei belong to glial cells.

✓ **Herring Bodies** - dilations of axons filled with neuro-secretion vesicles
- antidiuretic hormone(ADH)
- oxytocin

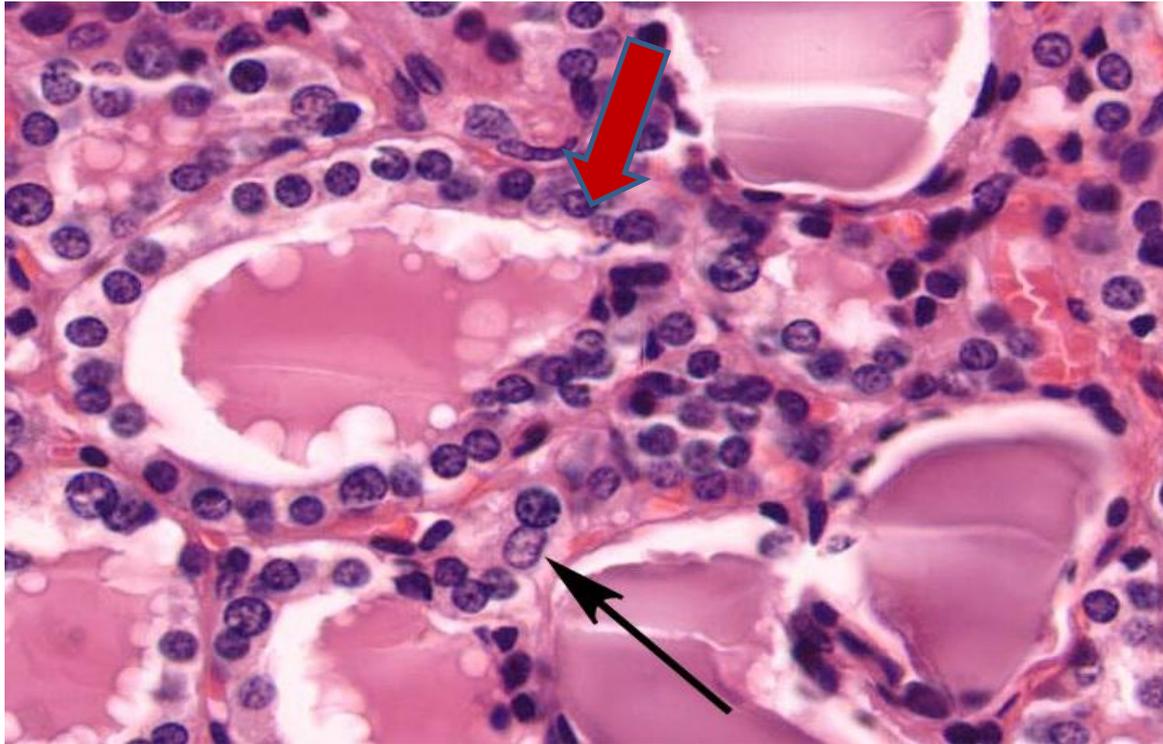
Thyroid Gland



Stroma

1. **Capsule:** enclosed the gland by thin layer of CT.
2. **Trabeculae:** CT extends inwards from the capsule to partially outline irregular lobes and lobules.

Thyroid Gland

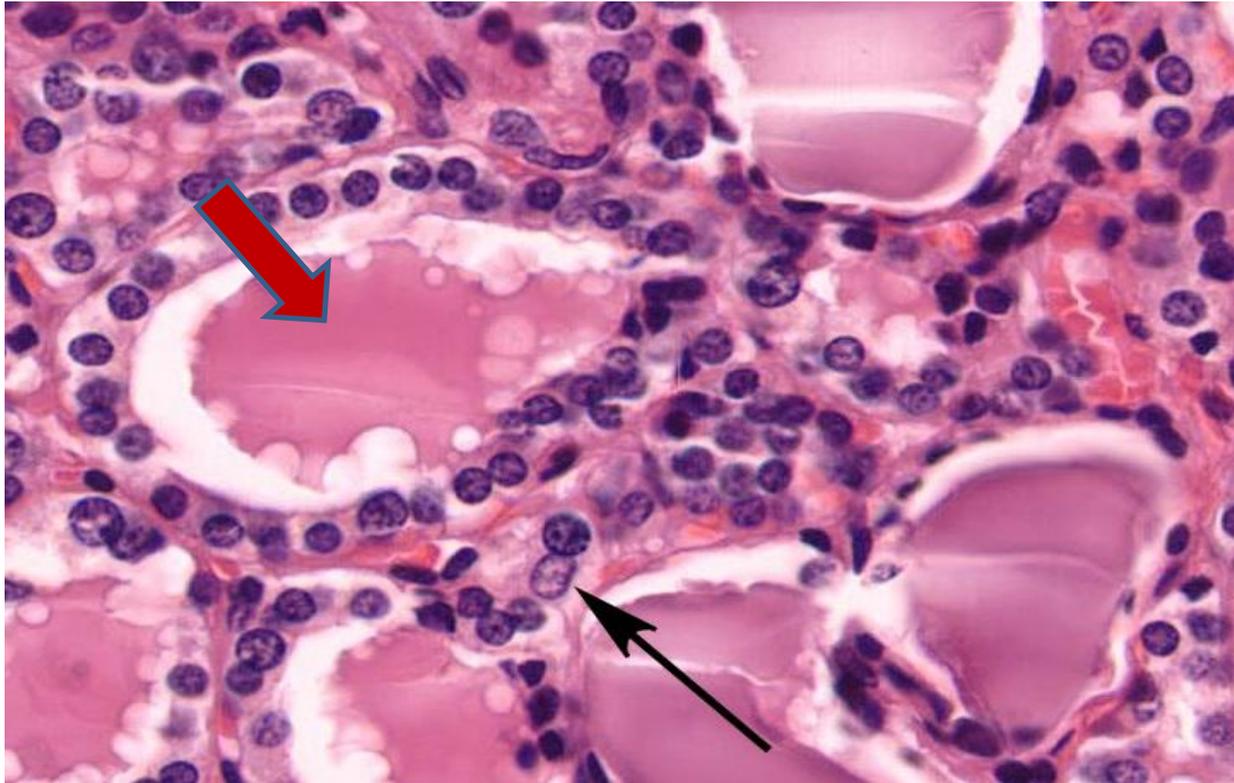


Parenchyma

✓ **Follicular Cells (Thyrocytes):** follicles are lined by a simple cuboidal to columnar epithelium (depending on functional activity).

✓ **Parafollicular Cells (C cells):** also found inside the basal lamina of the follicular epithelium or as isolated clusters between follicles, small numbers of larger cells, poorly stained with H&E.

Thyroid Gland



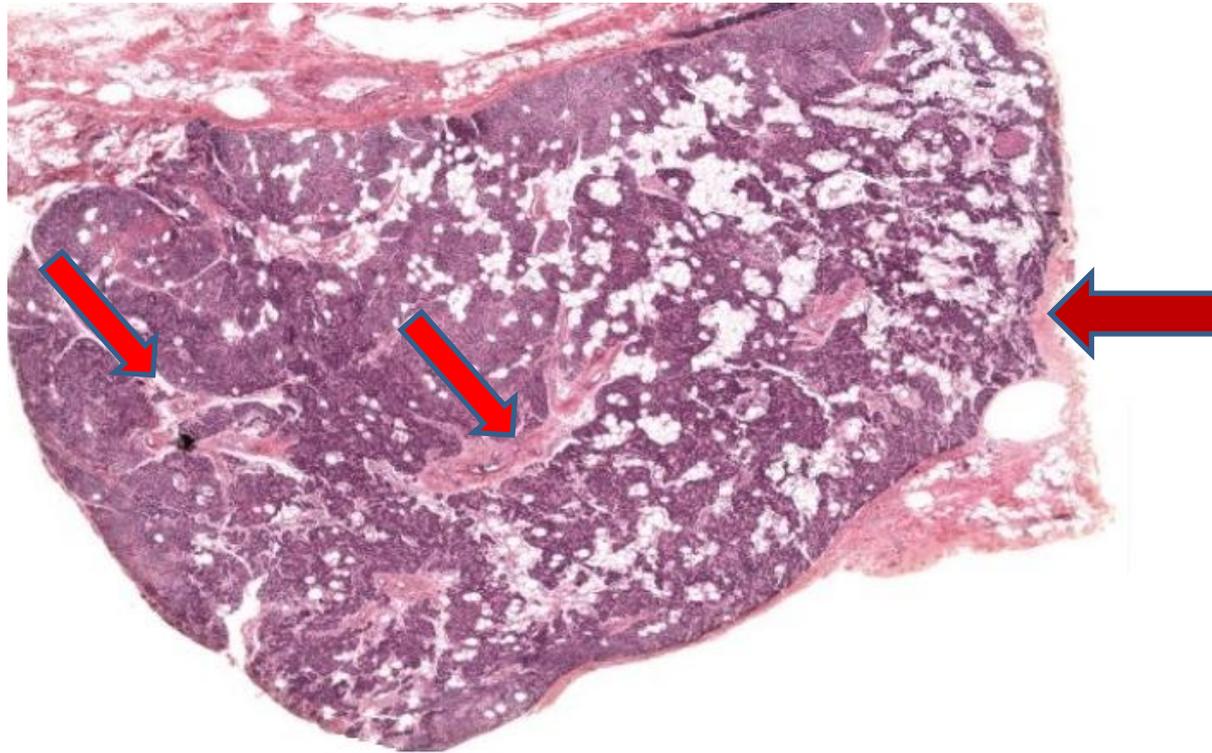
Parenchyma

Colloid: the gel-like mass.

✓ It is mostly the protein **thyroglobulin (pink)** and bound thyroid hormones (triiodothyronine T3 and tetraiodothyronine T4 (or **thyroxin**)).

✓ The clear space around the colloid is a shrinkage artifact.

Parathyroid Gland

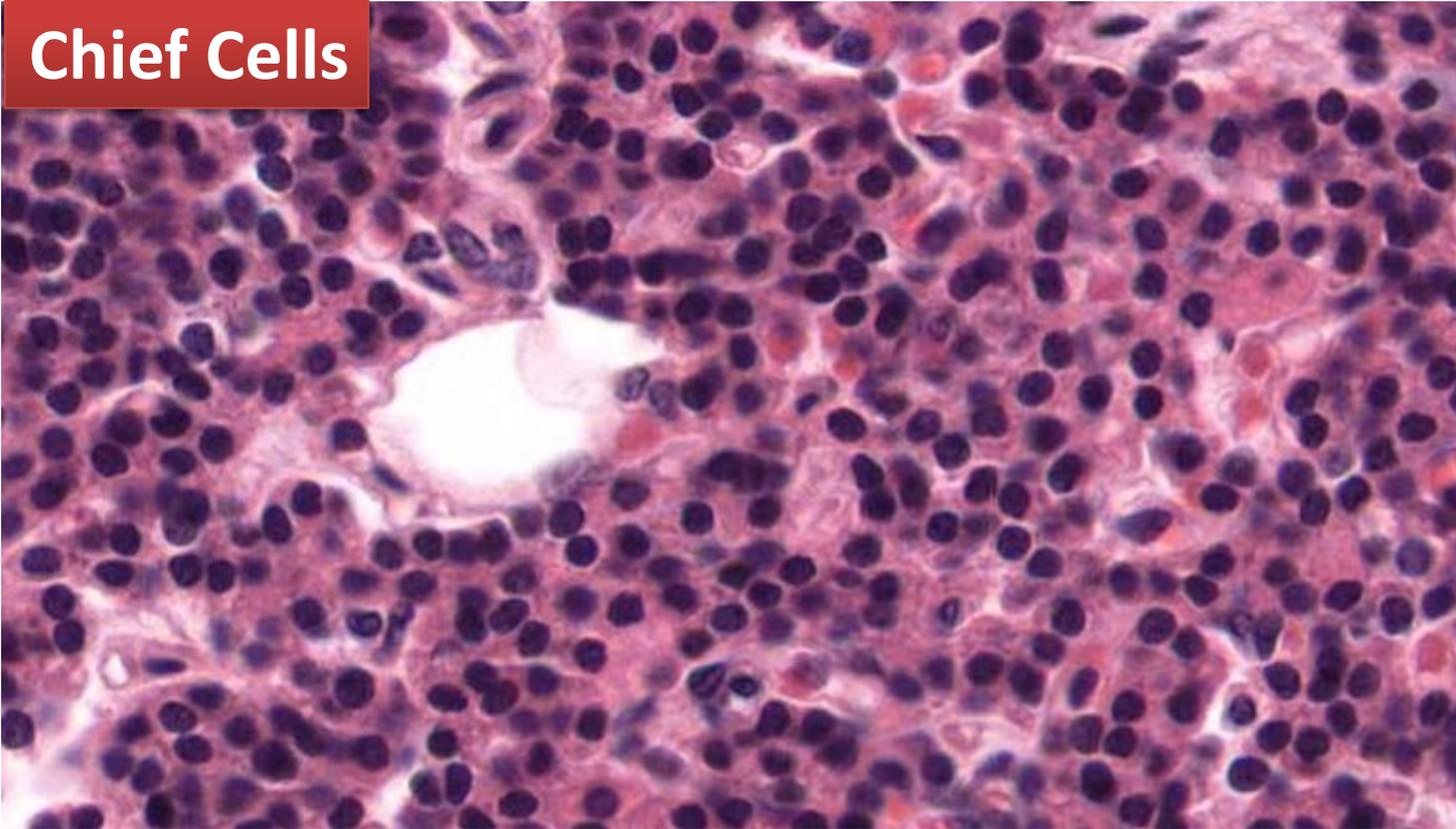


Stroma

1. **Capsule:** enclosed the gland by a thin layer of CT.
2. **Trabeculae:** CT extends inwards from the capsule to partially outline irregular lobes and lobules.

Parathyroid Gland

Chief Cells

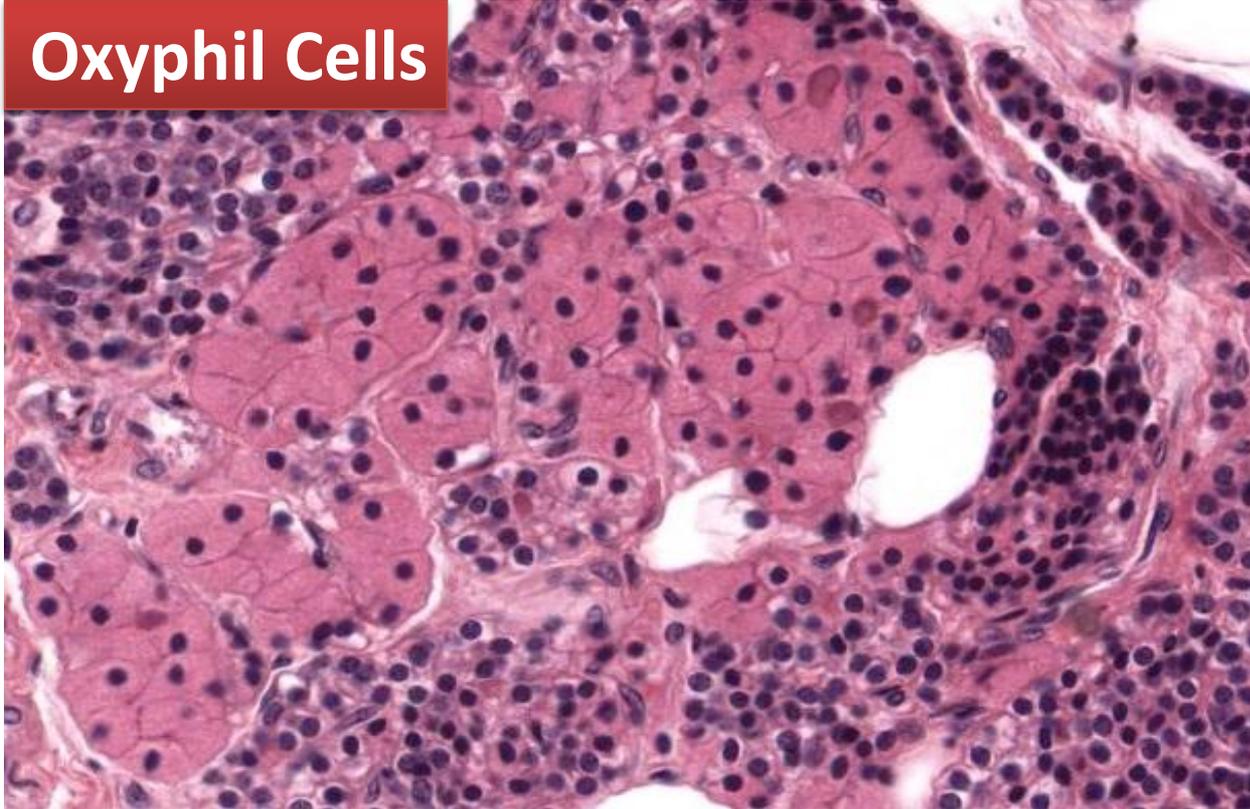


Parenchyma

- ✓ The majority of cells in the parathyroid.
- ✓ Small cells with dark nuclei and thin rim of lightly stained cytoplasm.
- ✓ They secrete parathyroid hormone (PTH)

Parathyroid Gland

Oxyphil Cells

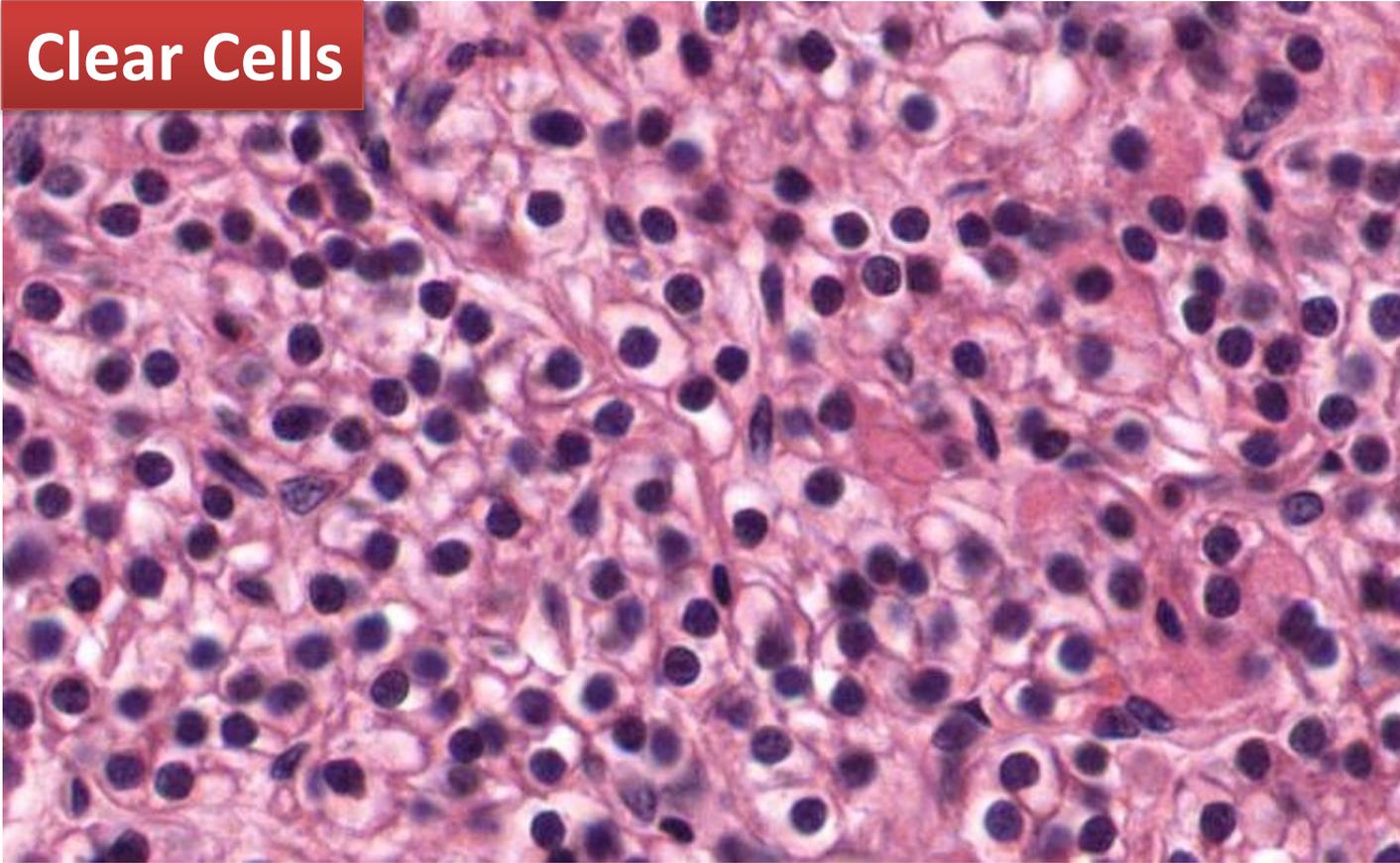


Parenchyma

- ✓ larger cells with dark nuclei and strongly eosinophilic cytoplasm (because of numerous mitochondria).
- ✓ They appear after the first decade of life and are thought to be non-secretory cells

Parathyroid Gland

Clear Cells

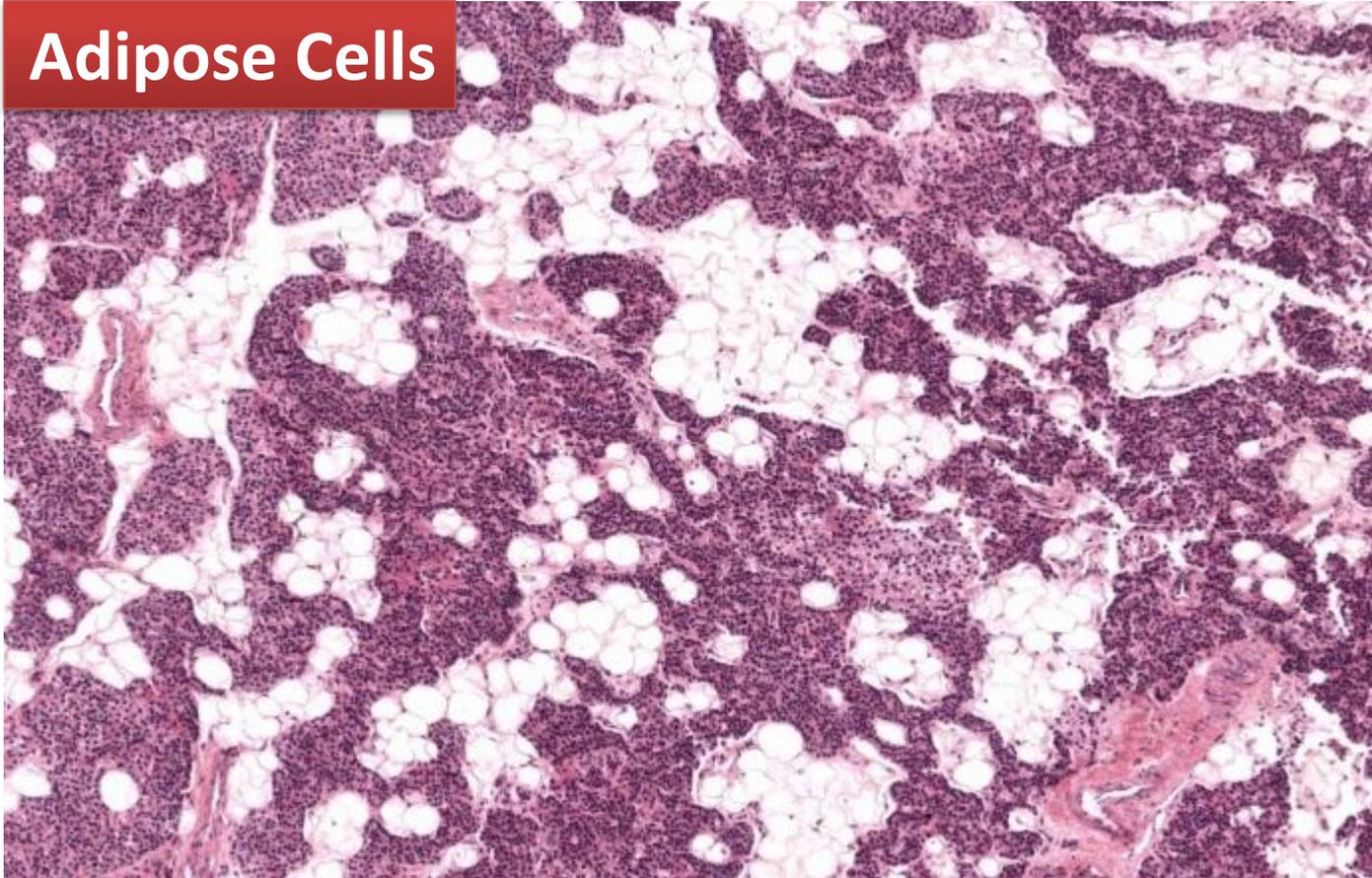


Parenchyma

✓ larger cells with dark nuclei and a watery, clear cytoplasm

Parathyroid Gland

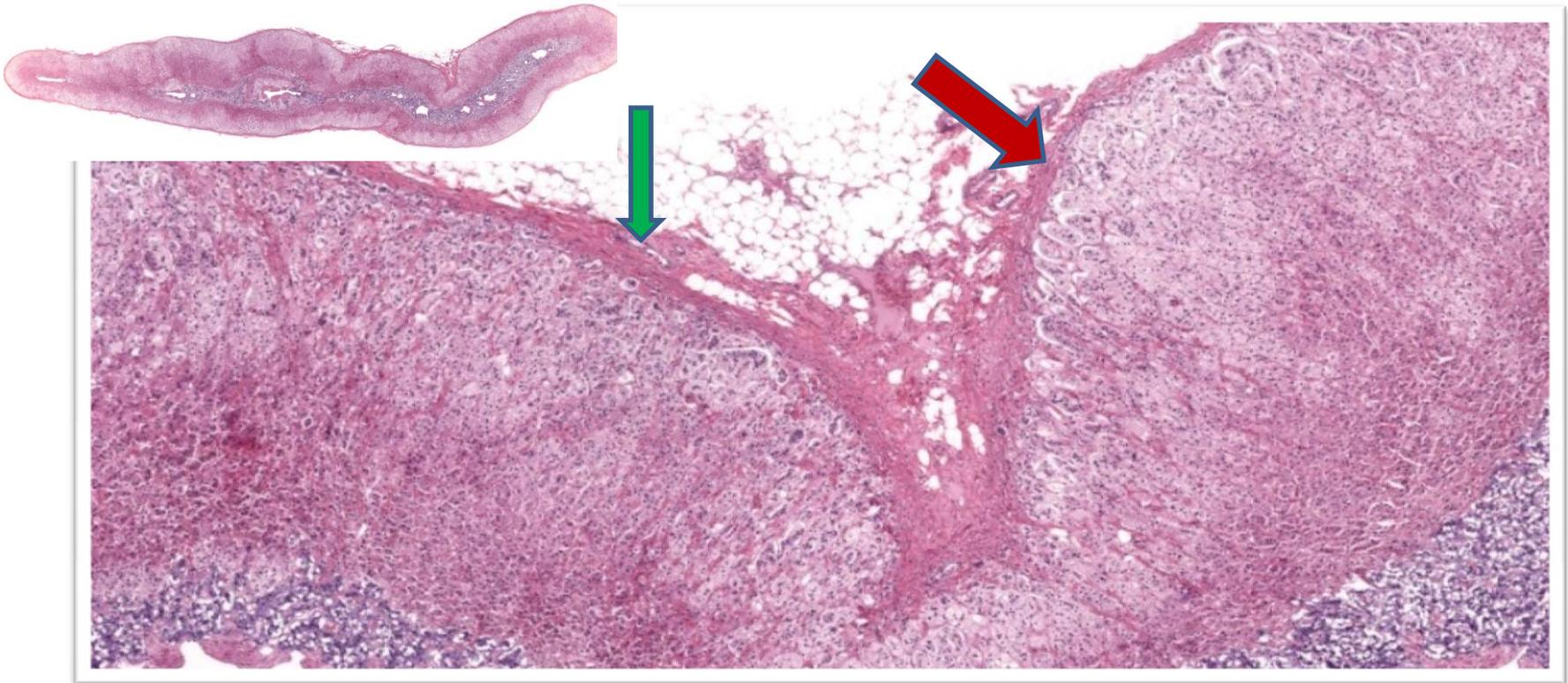
Adipose Cells



Parenchyma

✓ Adipose Cells: increase with age

Adrenal Gland

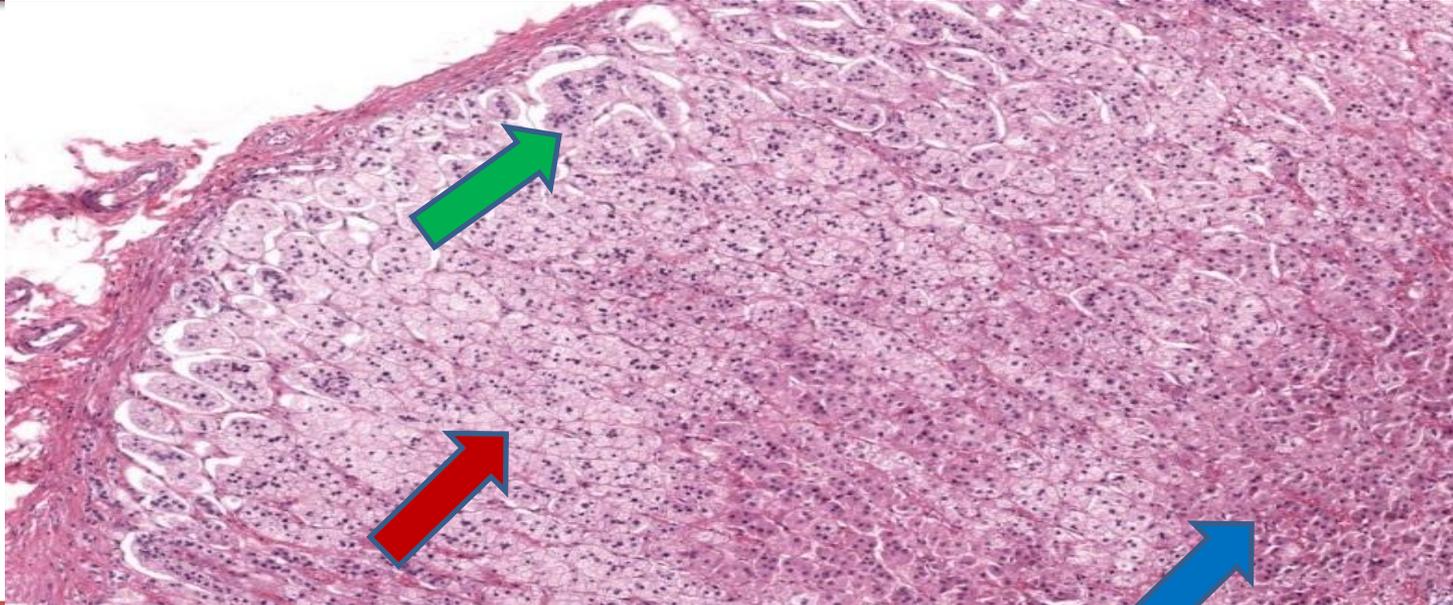


Stroma

Capsule: enclosed by a thin layer of CT.

Afferent Blood Vessels: penetrate the capsule and branch into sinusoids that supply the cortex and medulla.

Adrenal Gland



Parenchyma: Cortex: cells that synthesize and secrete steroid hormones.

1. **Zona Glomerulosa:** outer zone (15%). Glomerular-like clusters of cells.

The cells have a central nucleus. Cells secrete: **mineralocorticoids. (Aldosteron)**

Zona Fasciculata: middle zone (65-80%). Two-cell wide vertical cords.

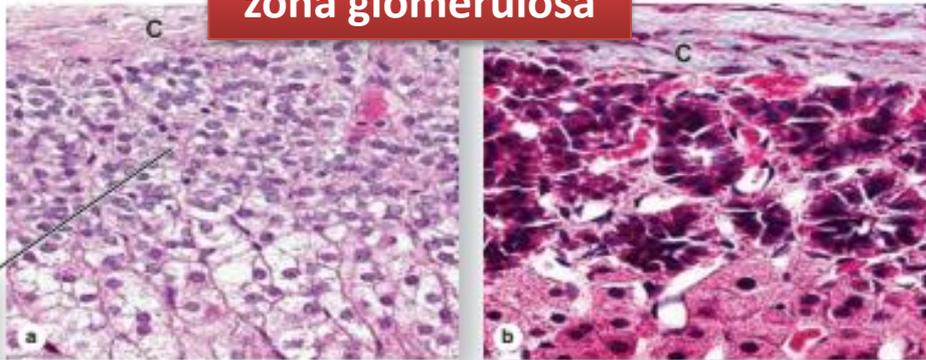
The cells have a central nucleus and lipid filled ("foamy") cytoplasm. Cells secrete: **glucocorticoids (cortisol)**

Zona Reticularis: inner zone (10%). One-cell wide anastomosing rows.

The cells have a central nucleus and eosinophilic cytoplasm. Cells secrete: **weak androgens, dehydroepiandrosterone (DHEA)**

Adrenal Gland

zona glomerulosa



closely packed, rounded or arched cords of columnar or pyramidal cells with many capillaries

zona fasciculata

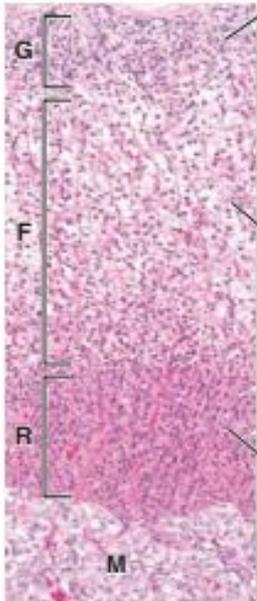


long cords of large polyhedral cells, one or two cells thick, separated by fenestrated sinusoidal capillaries. The cells are filled with lipid droplets and appear vacuolated

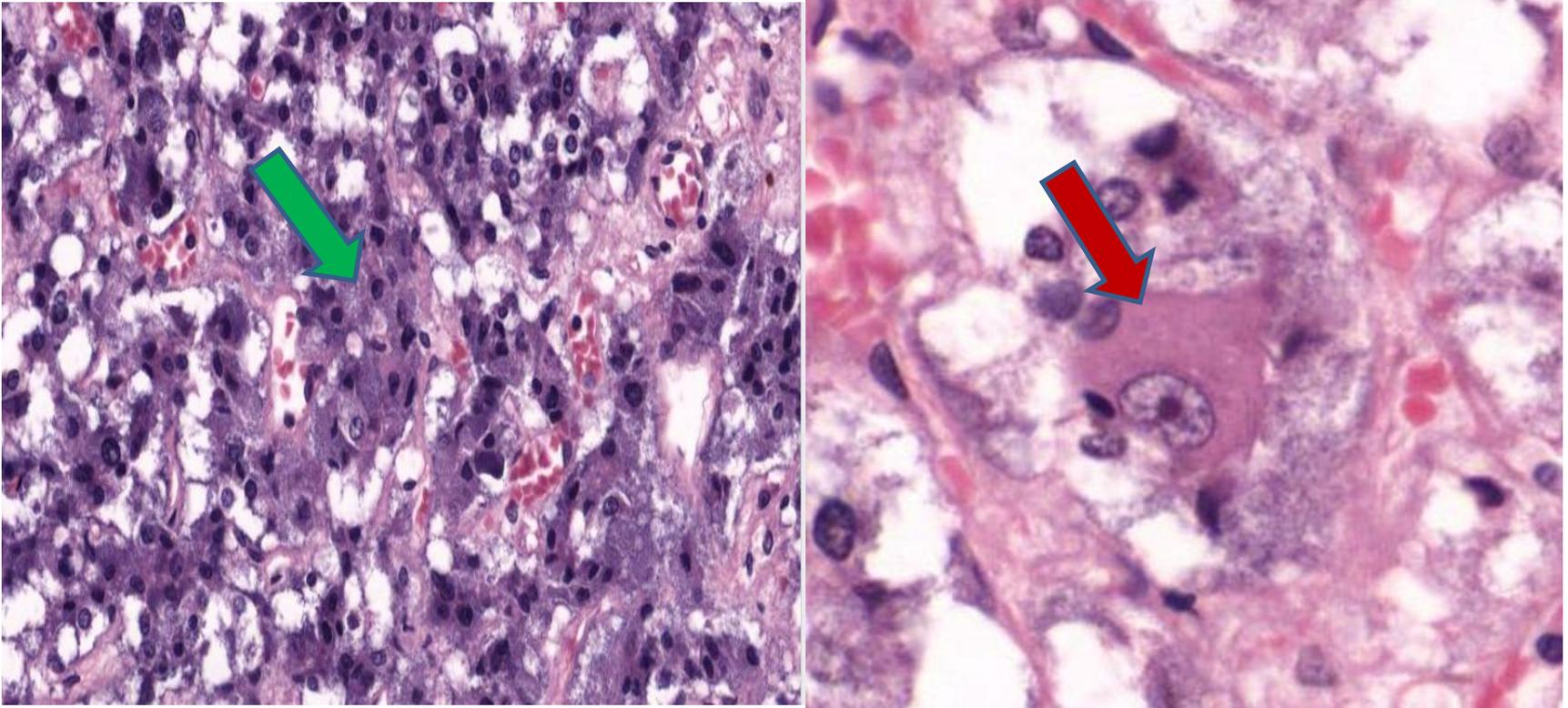
zona reticularis



smaller cells in a network of irregular cords interspersed with wide capillaries



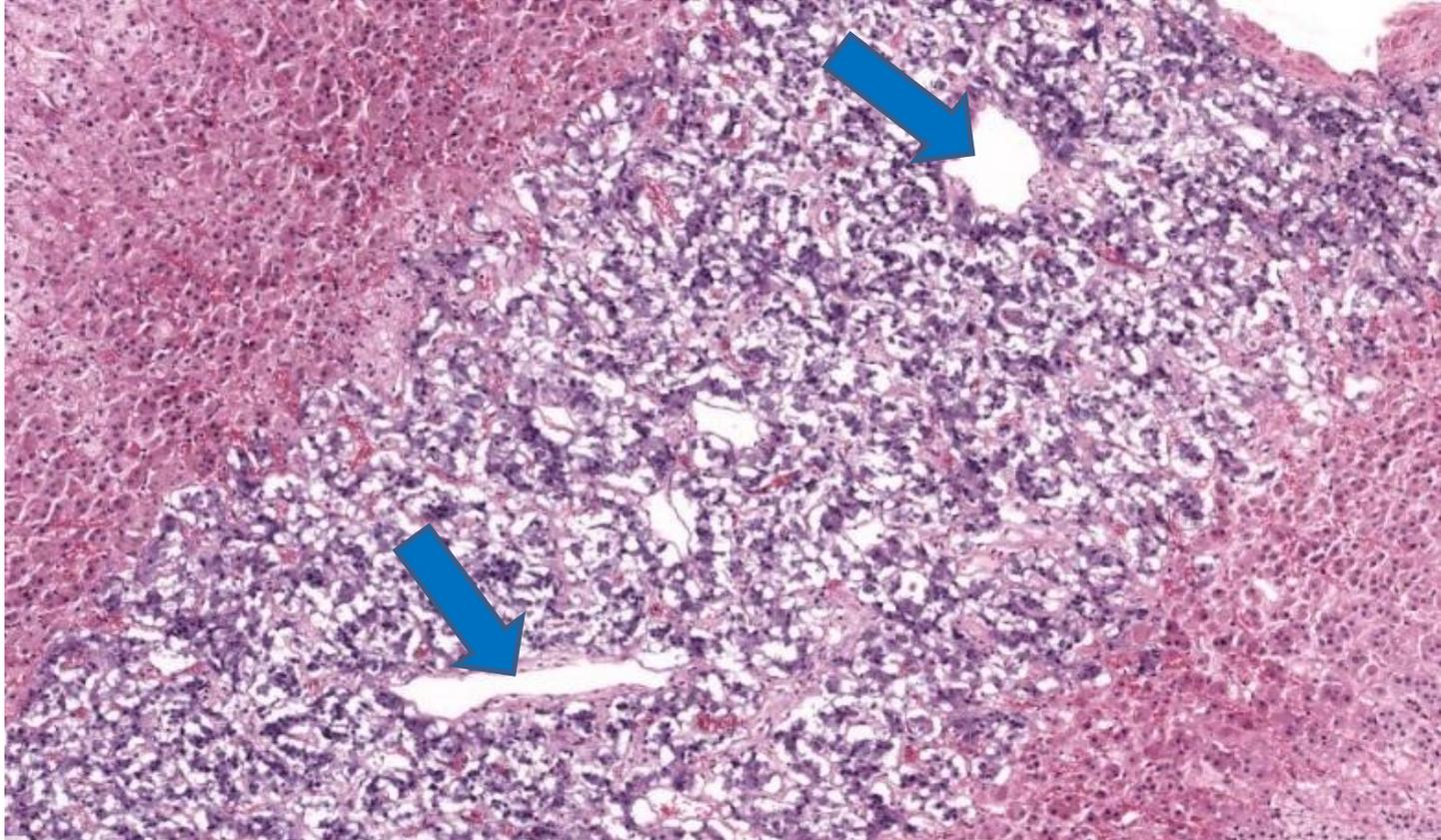
Adrenal Gland



Parenchyma : Medulla:

- ✓ **Chromaffin Cells:** modified postganglionic sympathetic neurons that secrete catecholamines (epinephrine or norepinephrine).
- ✓ **Ganglion Cells:** infrequent sympathetic ganglion cells.

Adrenal Gland

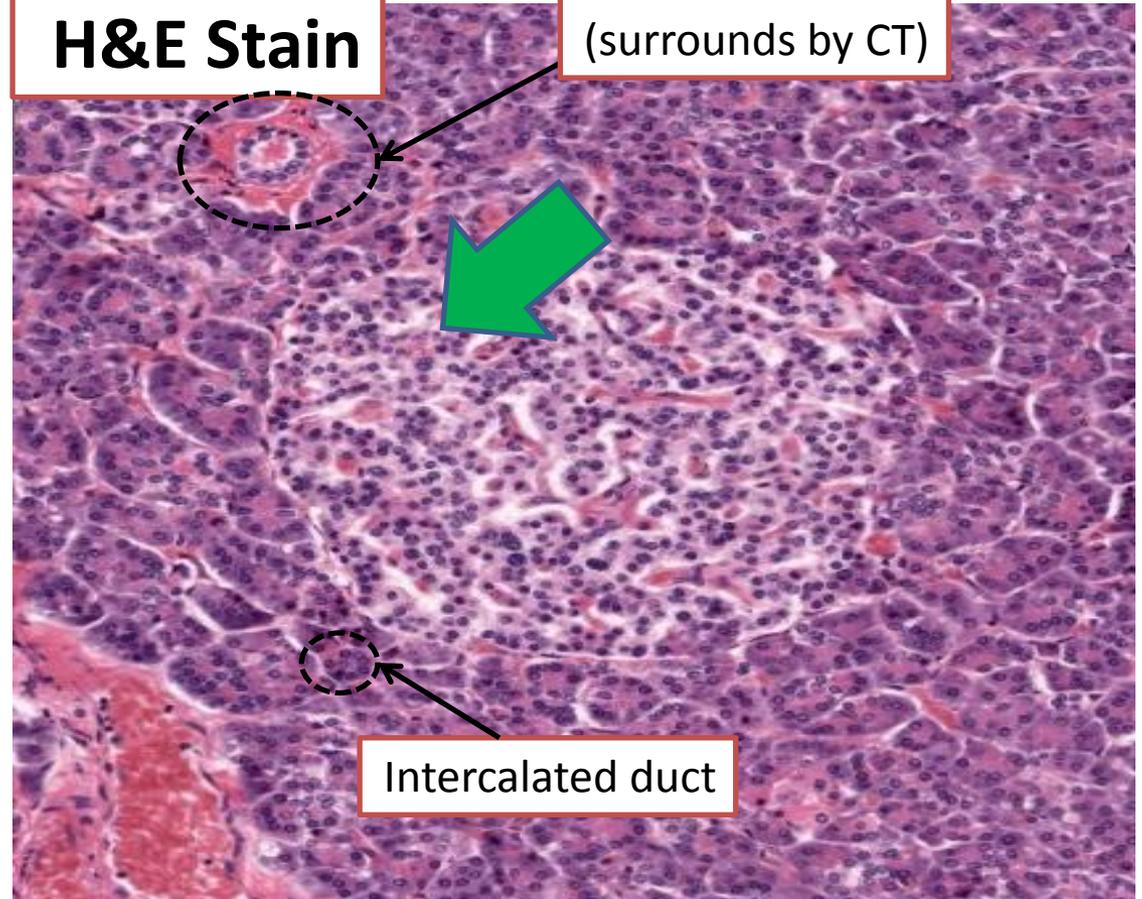


Parenchyma : **Medullary Vessels**: large veins that drain the organ.

Pancreas

H&E Stain

Interlobular duct
(surrounds by CT)



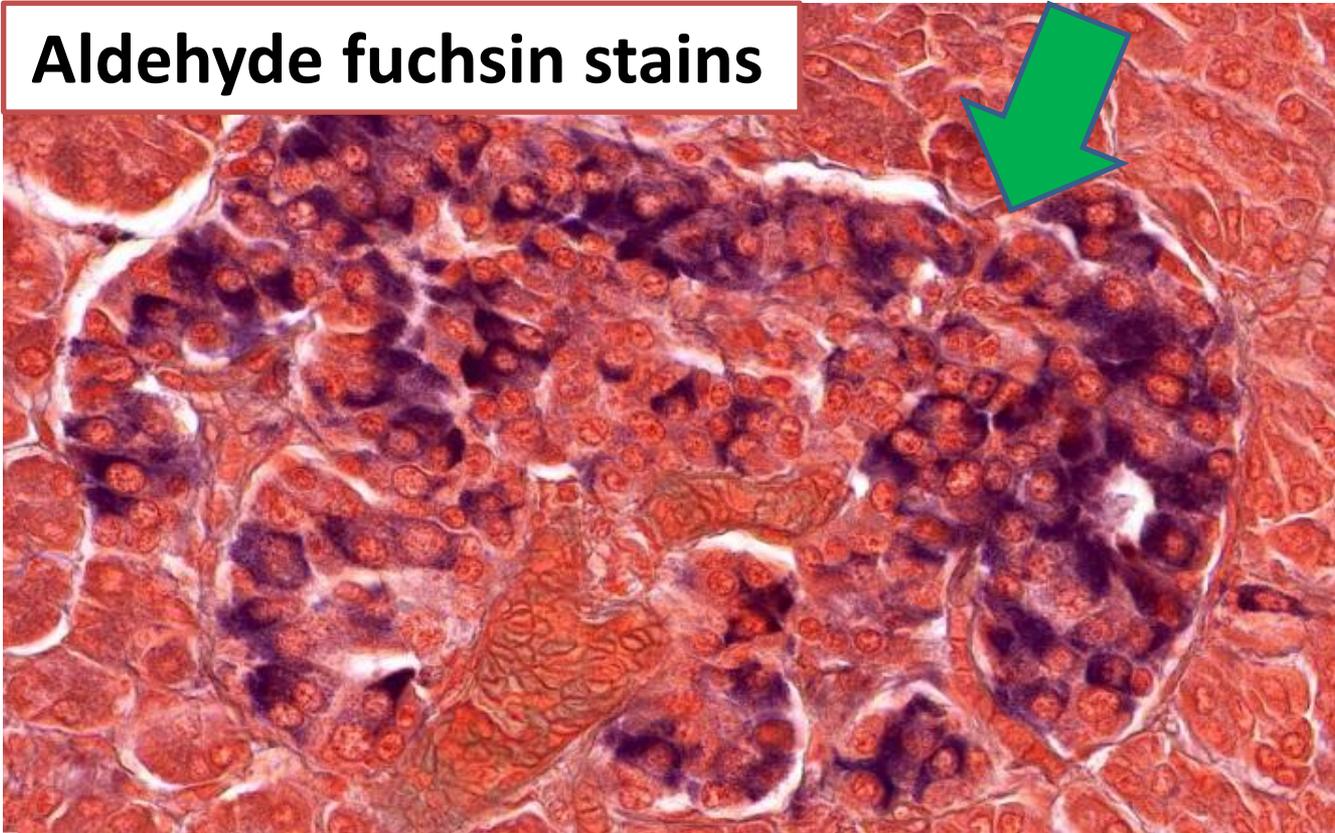
Intercalated duct

1. **Alpha cells** secrete primarily *glucagon* and are usually located peripherally.
2. **Beta cells** produce *insulin*, are the most numerous, and are located centrally.
3. **Delta cells** secreting *somatostatin*, are scattered and much less abundant.

"Islands" of endocrine cells (or islets of Langerhans)
✓ They are lighter staining than the exocrine cells by H&E

Pancreas

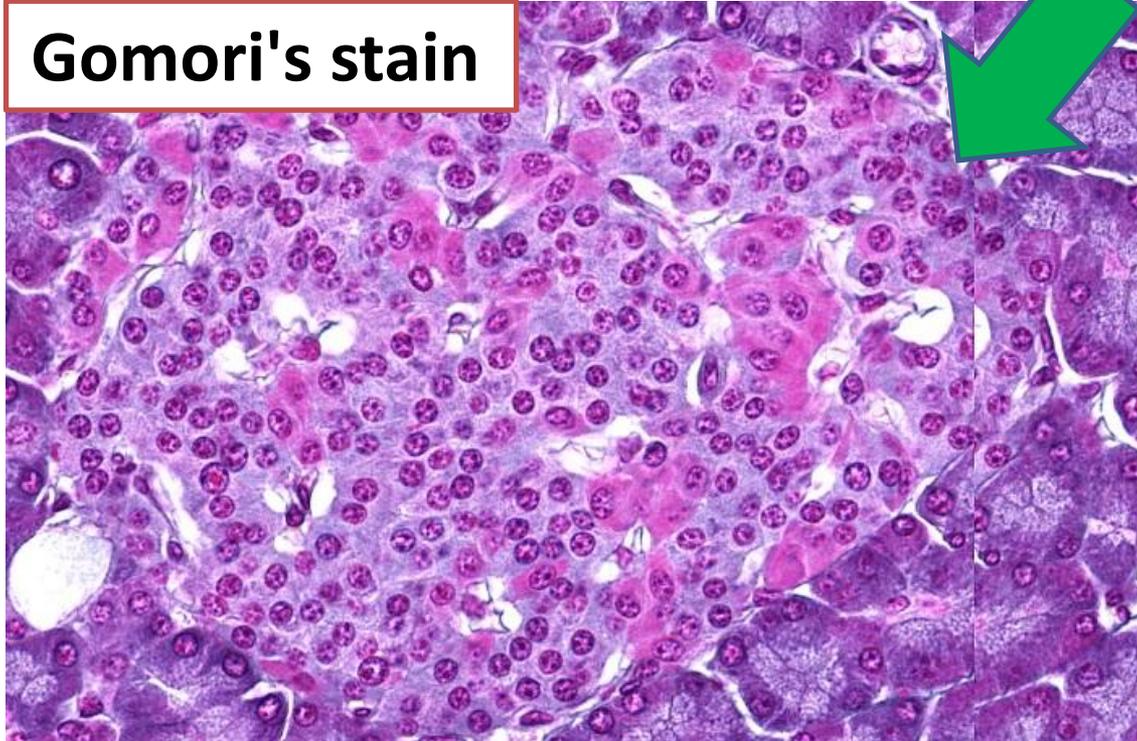
Aldehyde fuchsin stains



"Islands" of endocrine cells (or islets of Langerhans)
✓ Aldehyde fuchsin stains insulin in the **beta cells** of islets of Langerhans **a dark purple**

Pancreas

Gomori's stain



"Islands" of endocrine cells (or islets of Langerhans)

Gomori's stain was an early histochemical technique that distinguished between beta- and alpha-cells.

Beta cells stain blue, while **alpha cells stain pink**.