Histology of Endocrine Glands

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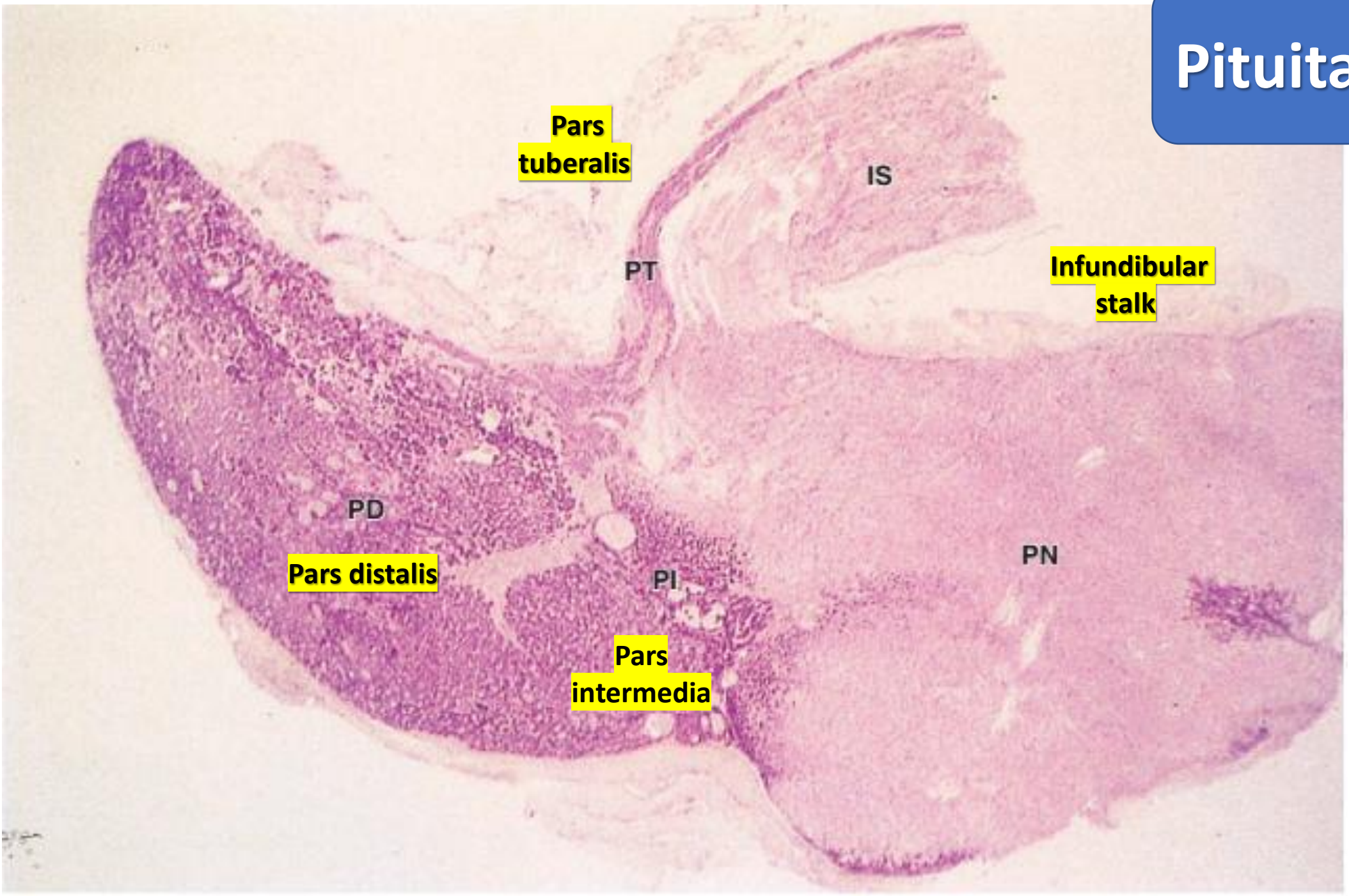
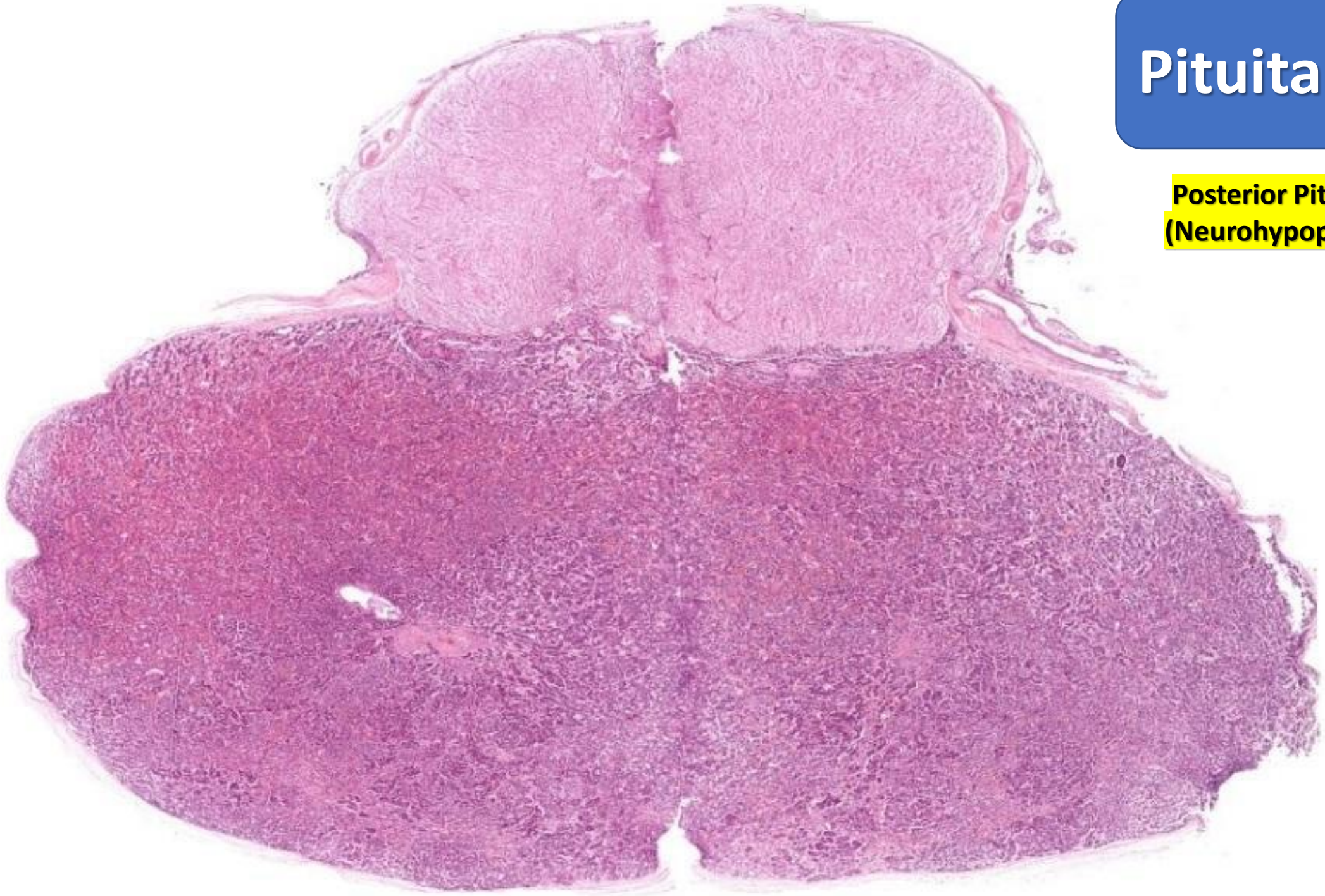
Pituitary Gland



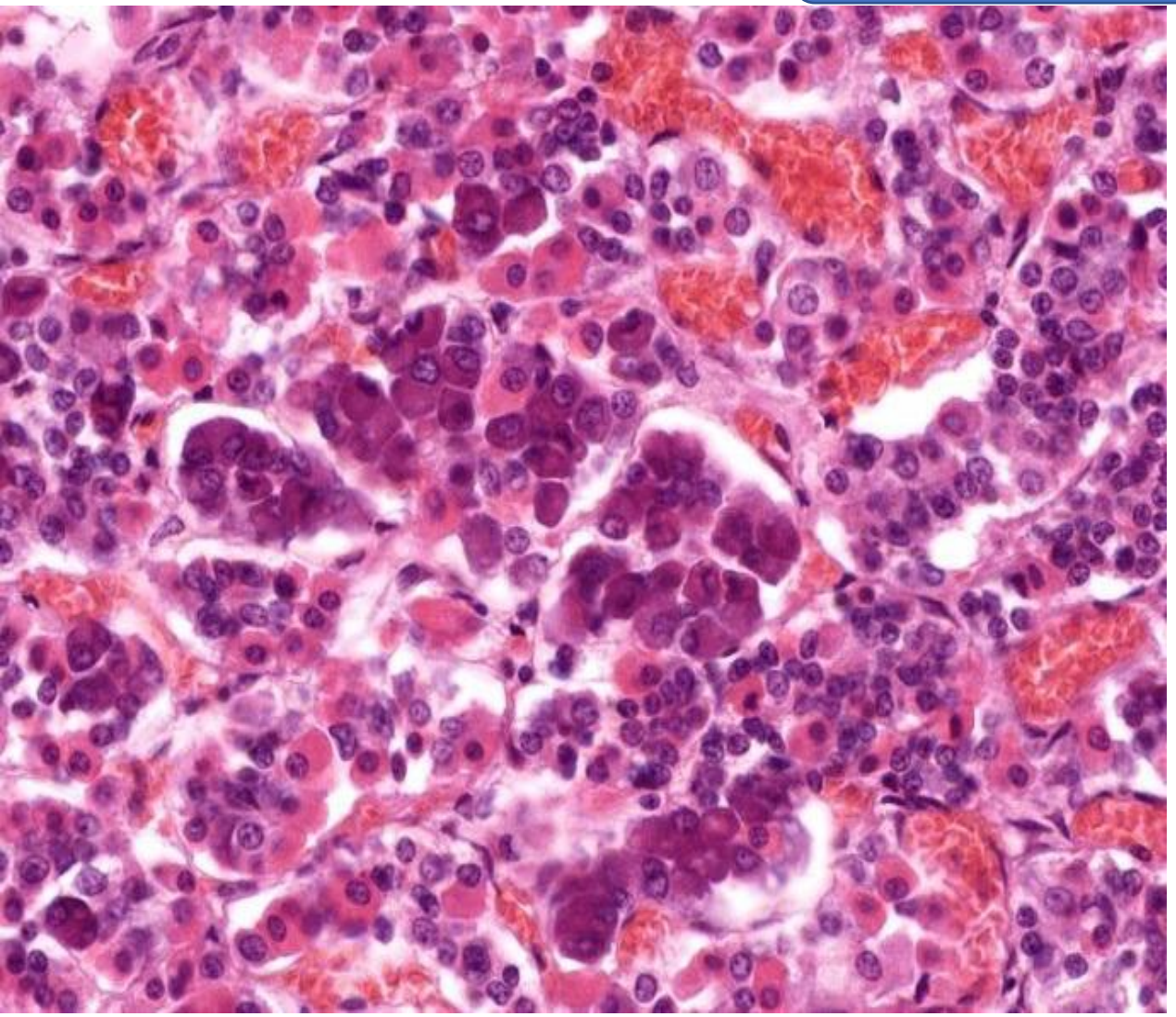
Pituitary Gland

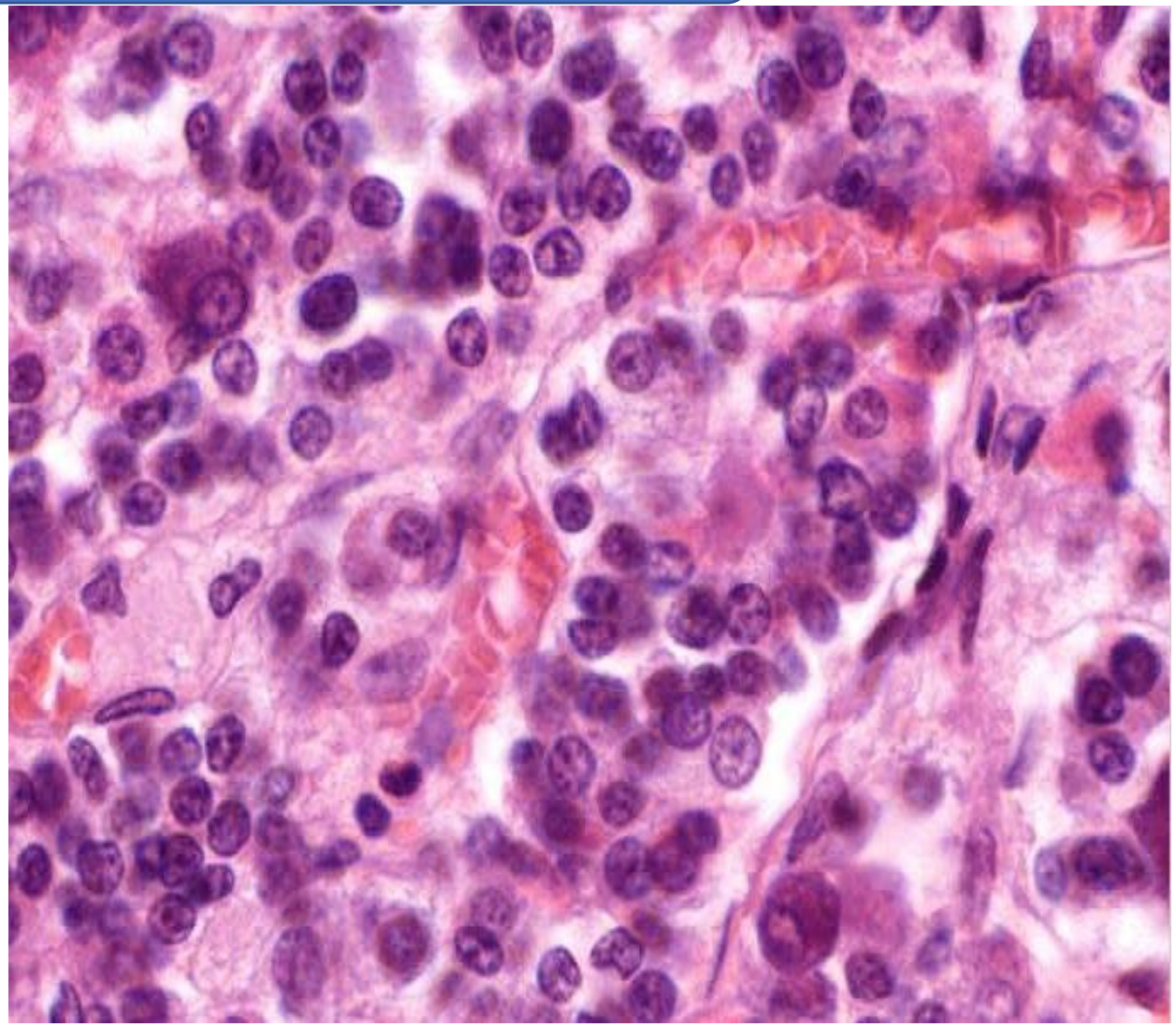


Posterior Pituitary
(Neurohypophysis)

Anterior Pituitary
Adenohypophysis

Cells of Pars Distalis



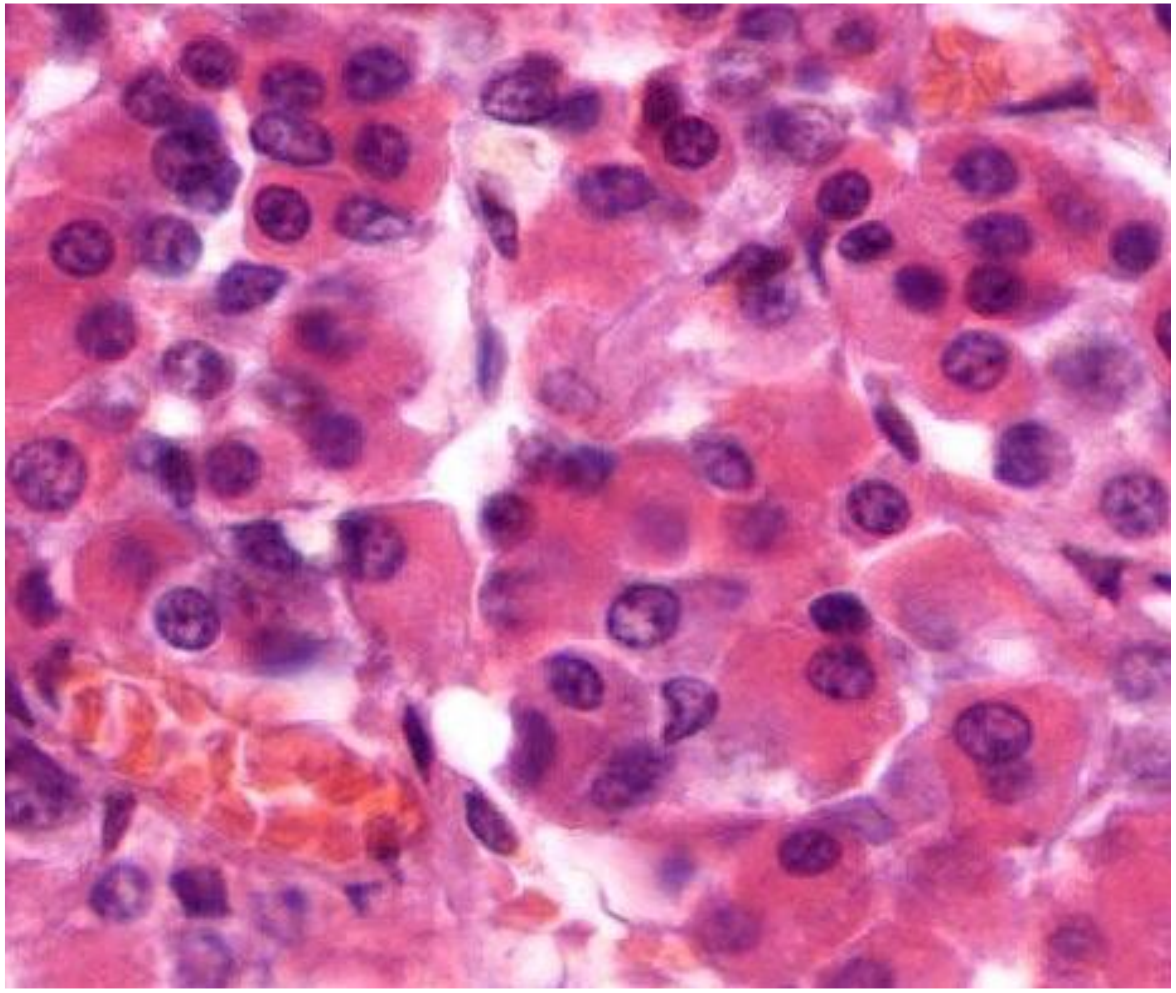


Chromophils: ***stain with H&E and secrete hormones***

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

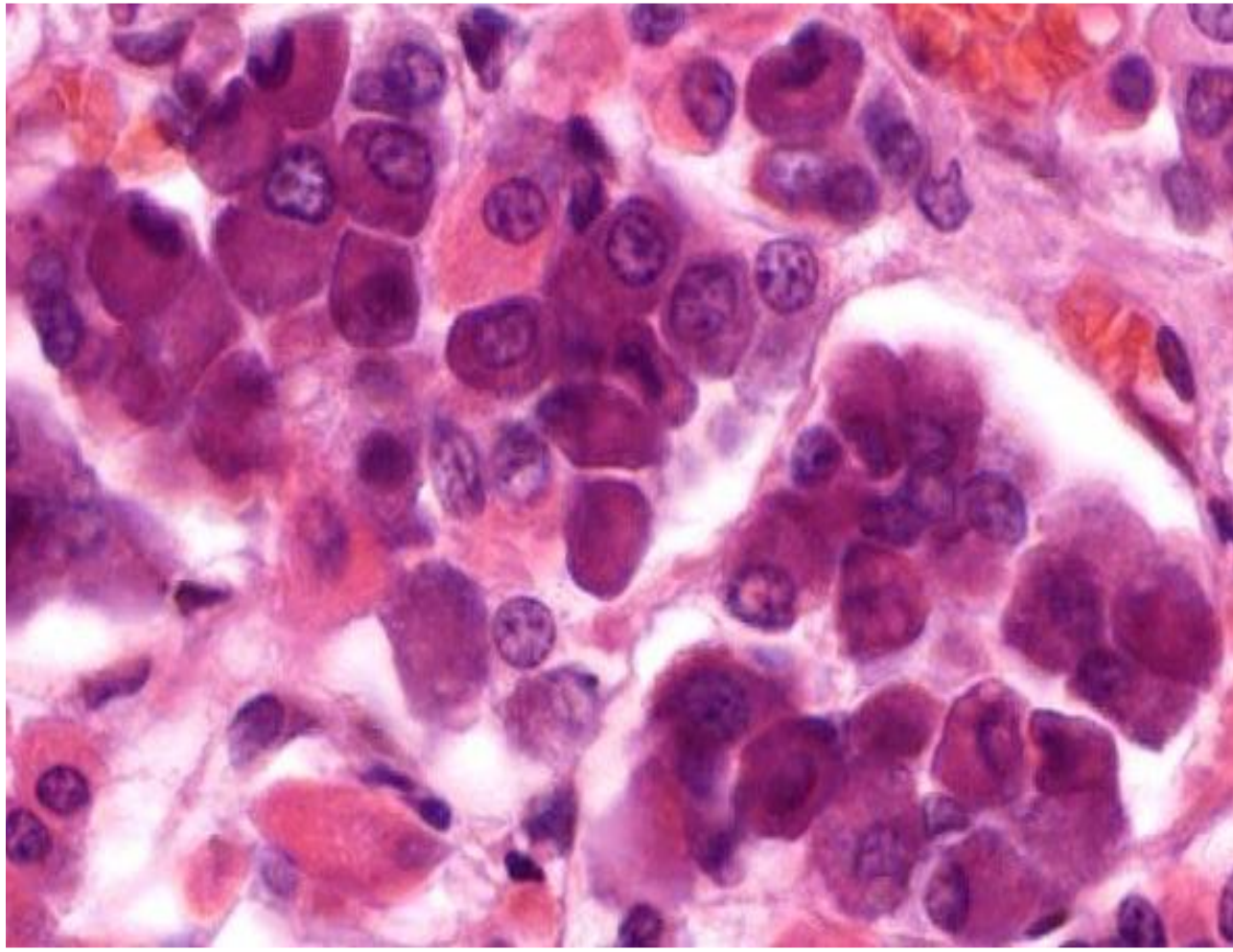
Chromophils of Pars Distalis

Acidophils: st*ain pinkish-red with H&E*



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

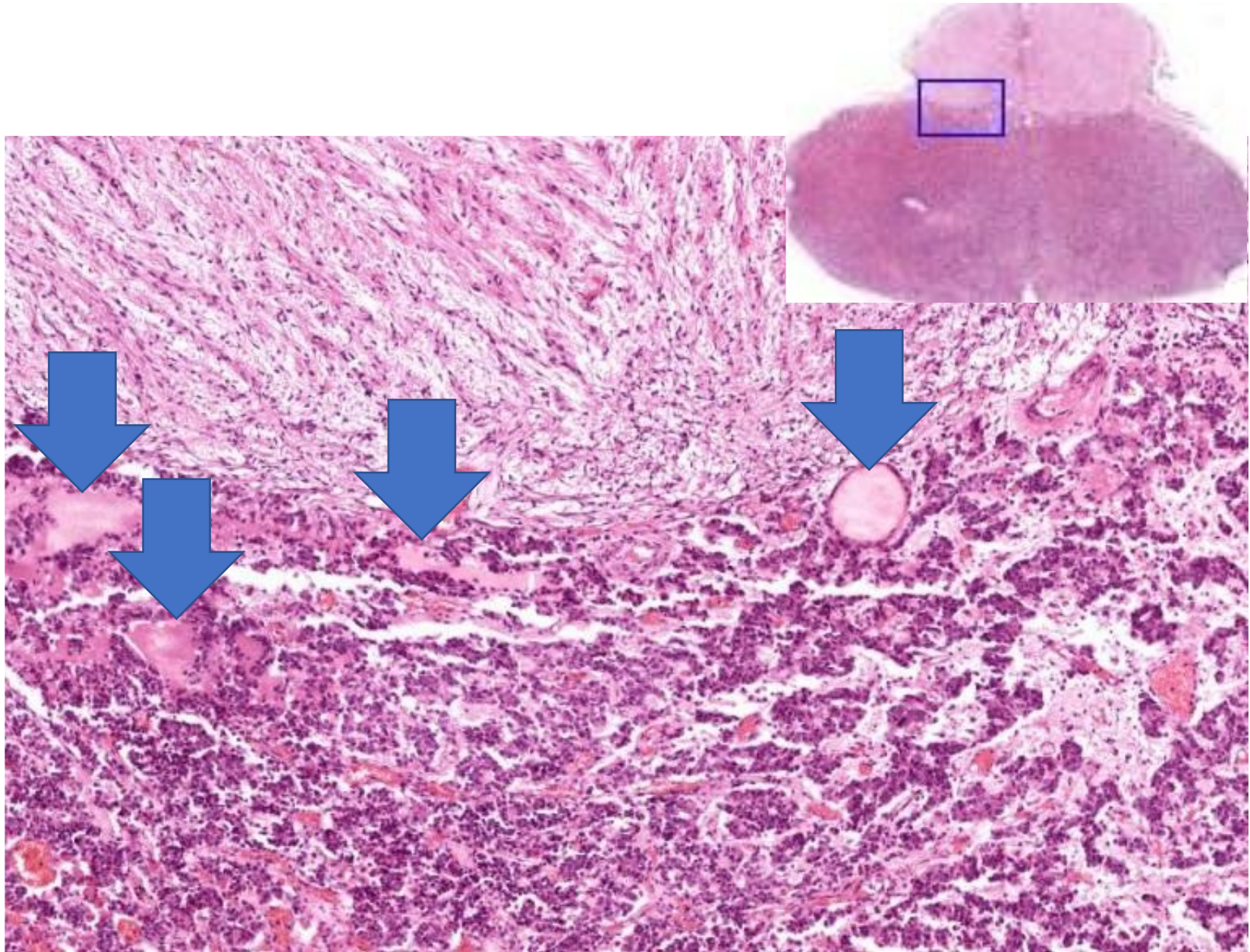
Basophils: st*ain bluish-purple with H&E*



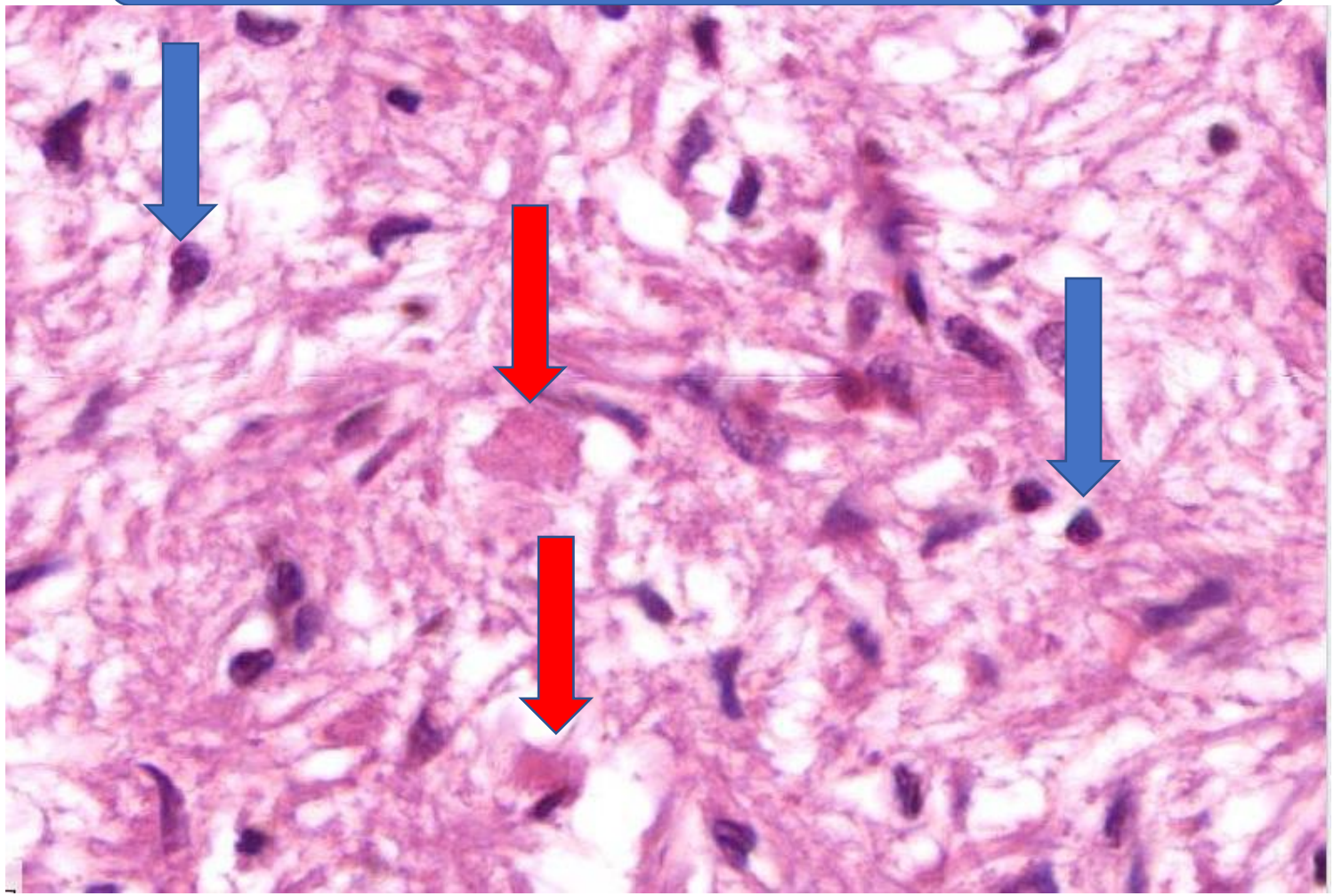
Thyrotrophs - TSH.
Corticotrophs - adrenocortical trophic hormone -ACTH.
Gonadotrophs - FSH and LH.

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



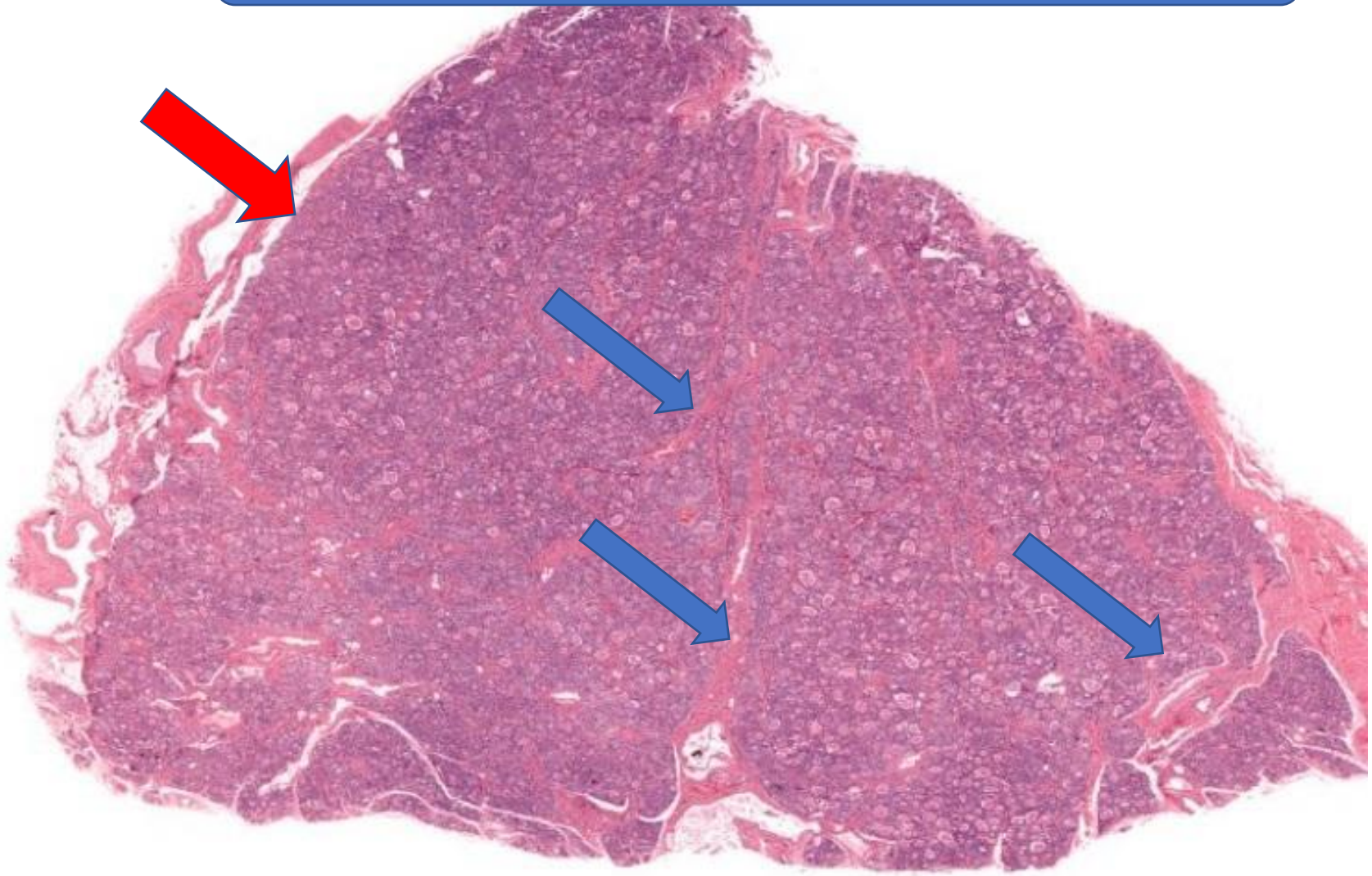
✓Axons from the hypothalamus that release hormones into the capillaries of the pars nervosa.

✓Pituicytes: most nuclei belong to glial cells.

✓Herring Bodies - dilations of axons filled with neuro-secretion vesicles.

- Antidiuretic hormone(ADH).

Thyroid Gland

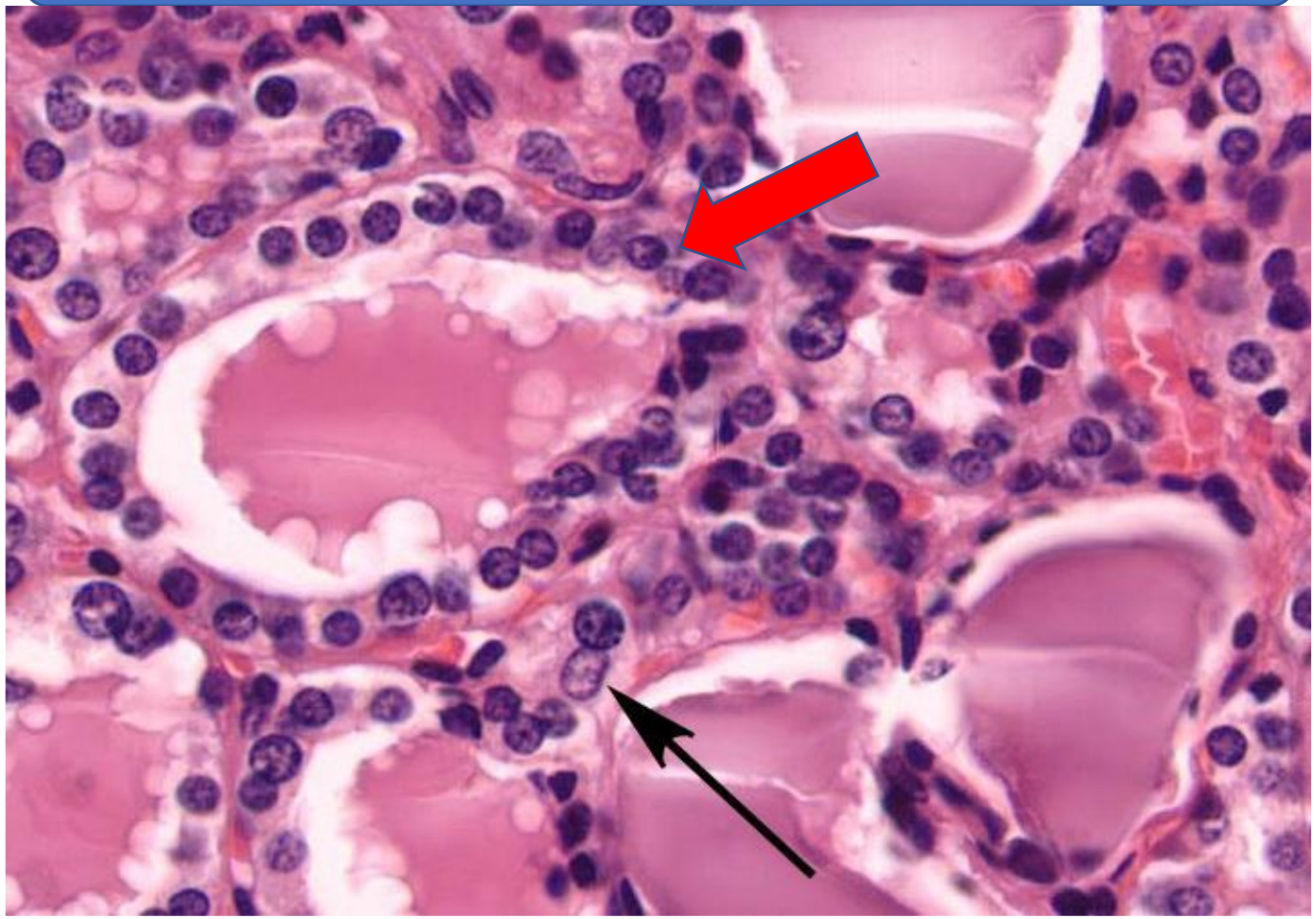


Stroma

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

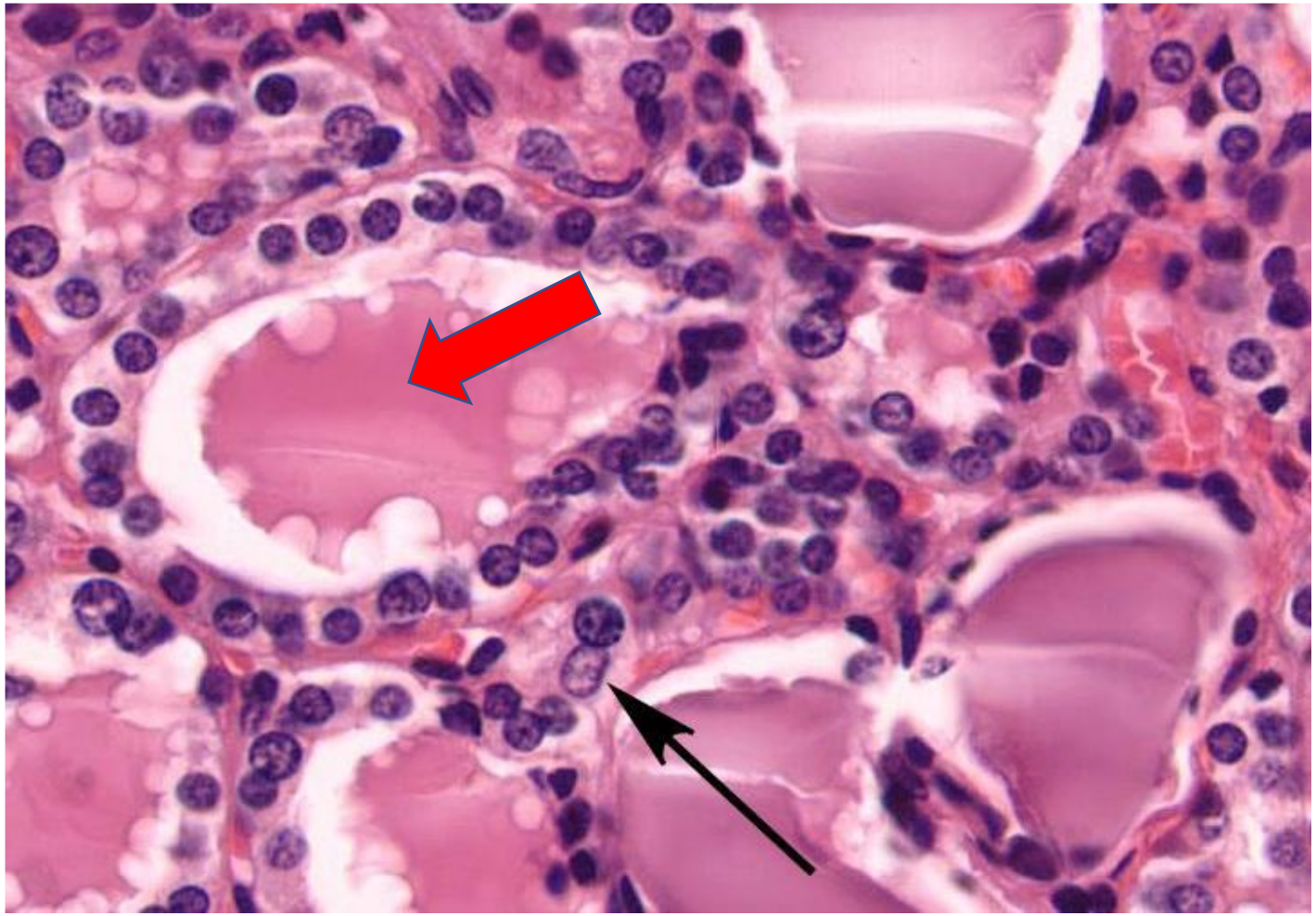


Parenchyma

✓**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



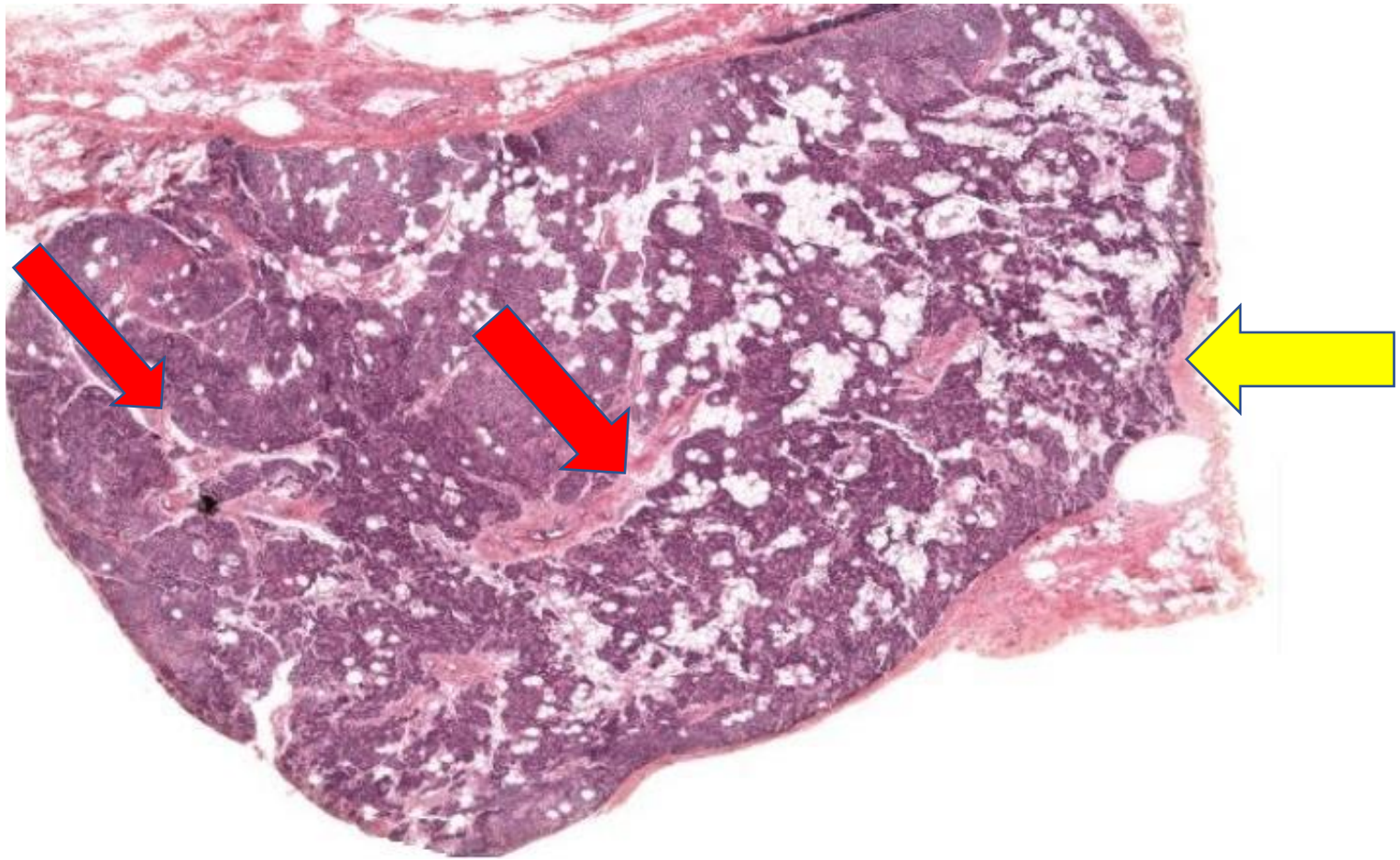
Parenchyma

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



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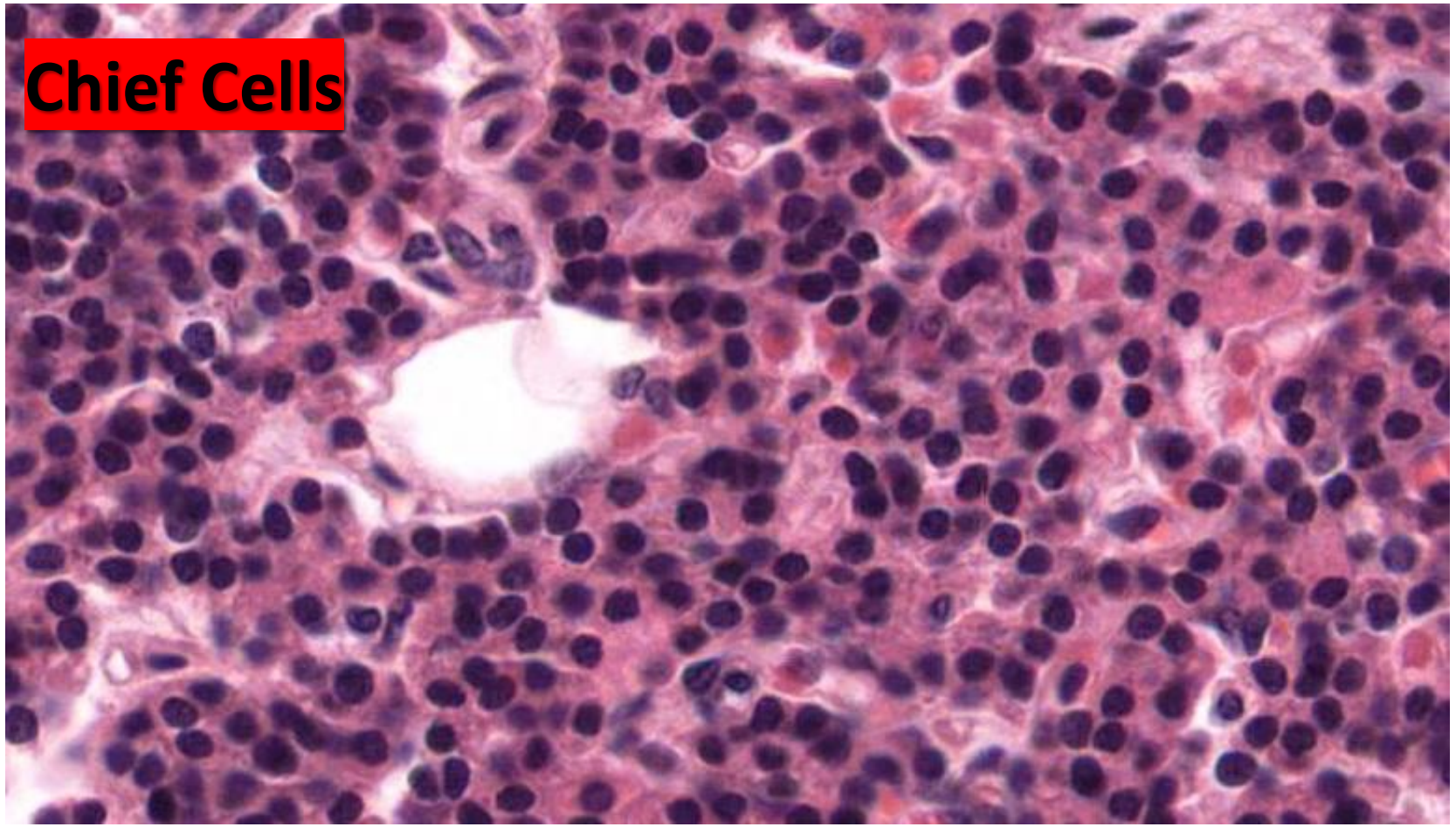
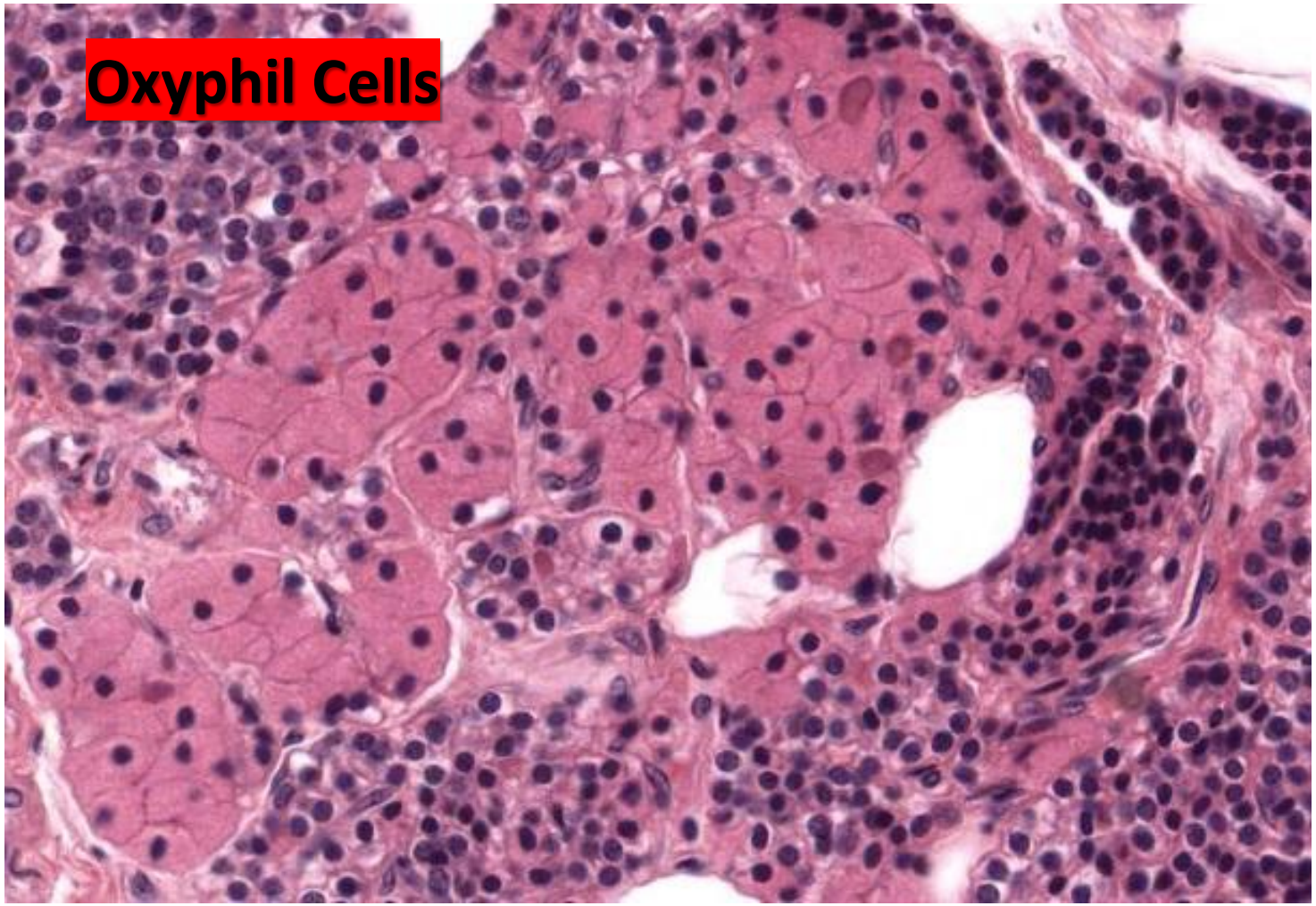
Parathyroid Gland



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)**

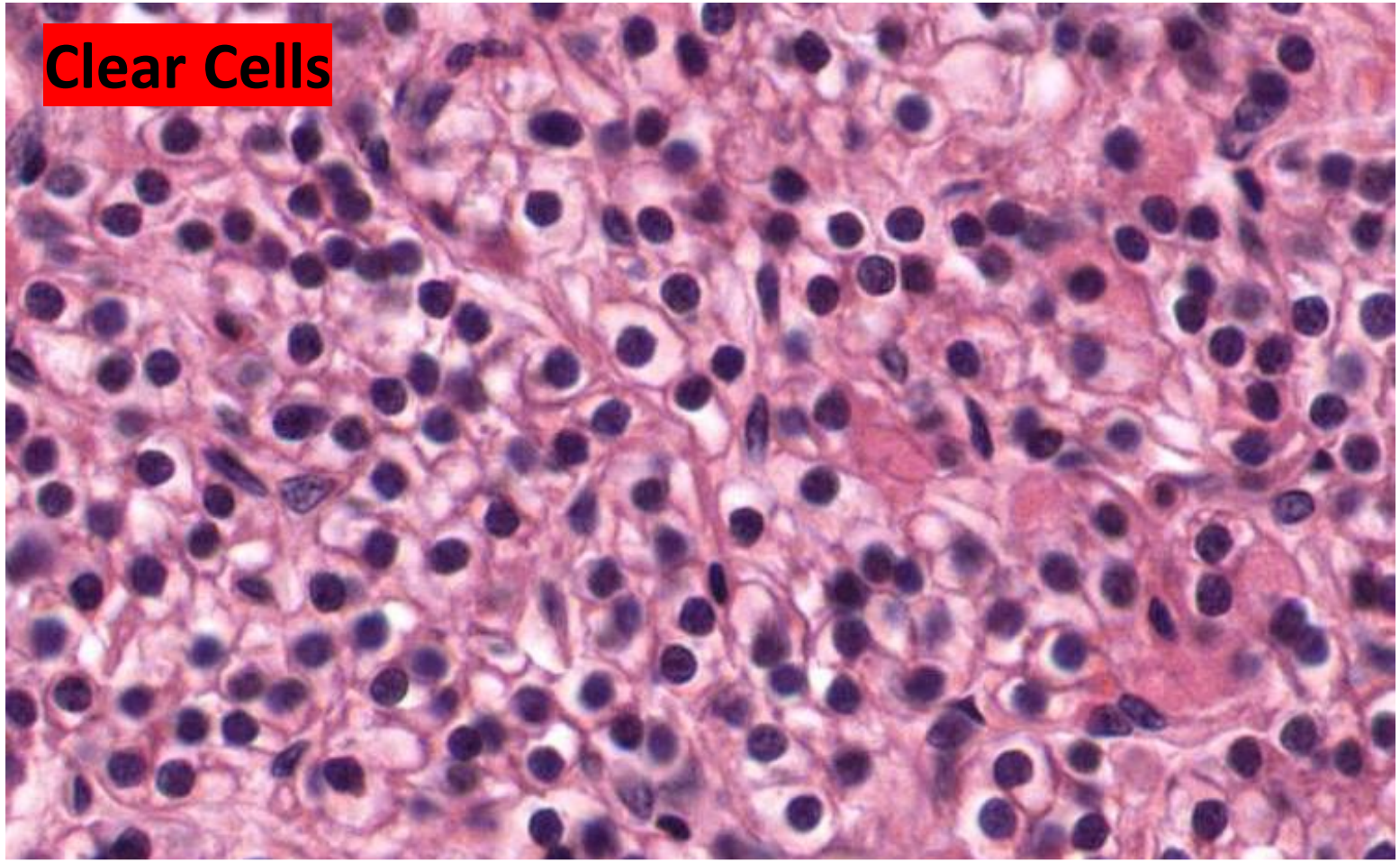
Parathyroid Gland



Parathyroid

✓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.

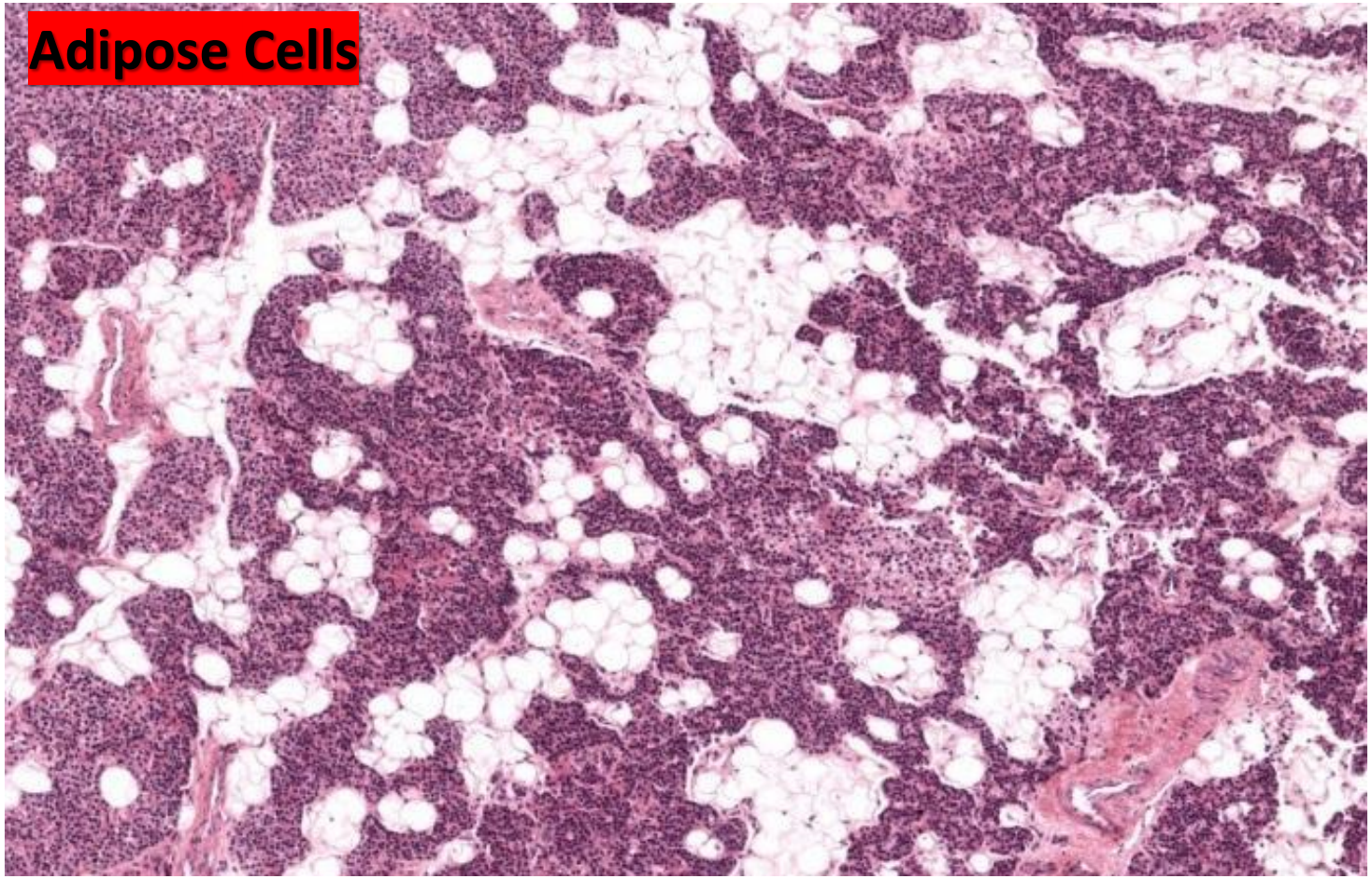
Parathyroid Gland



Parenchyma

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

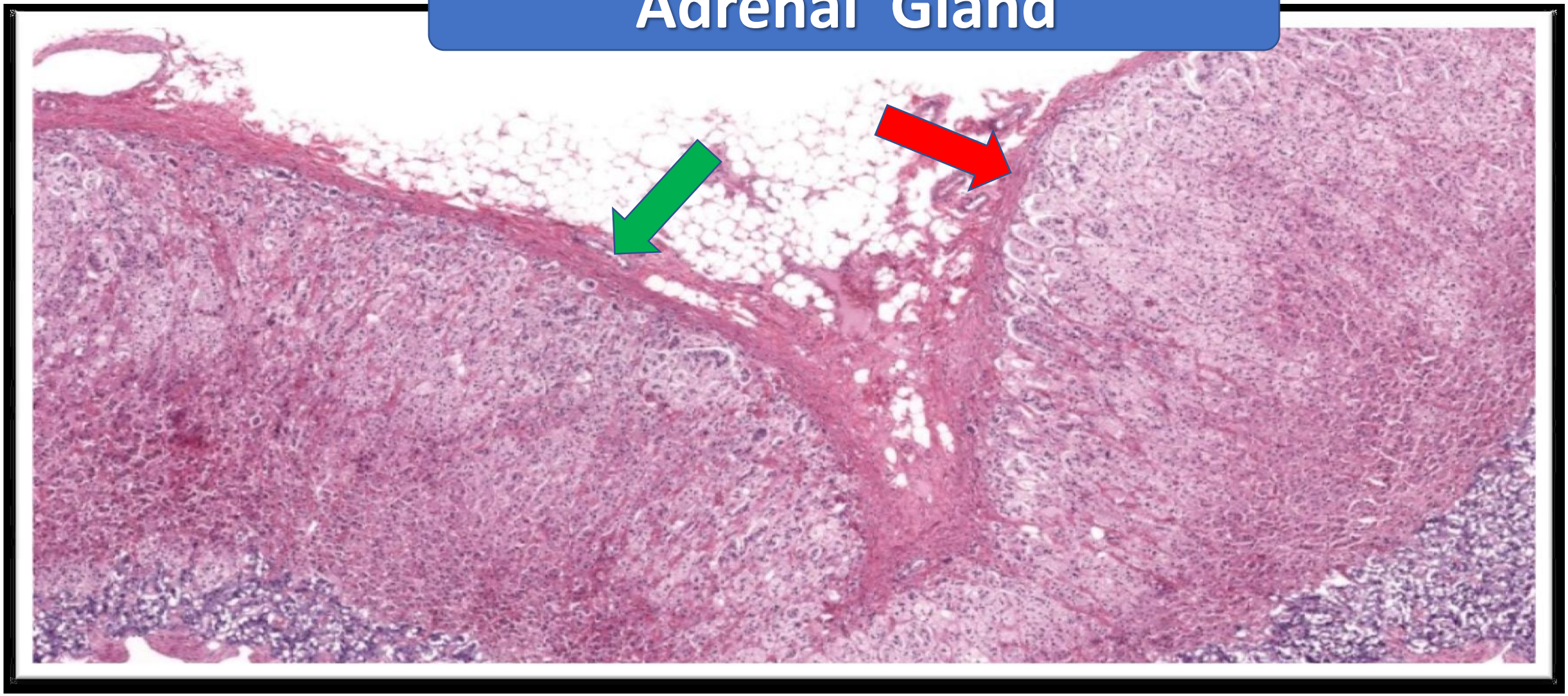
Parathyroid Gland



Parenchyma

- ✓ **Adipose Cells: increase with age.**

Adrenal Gland

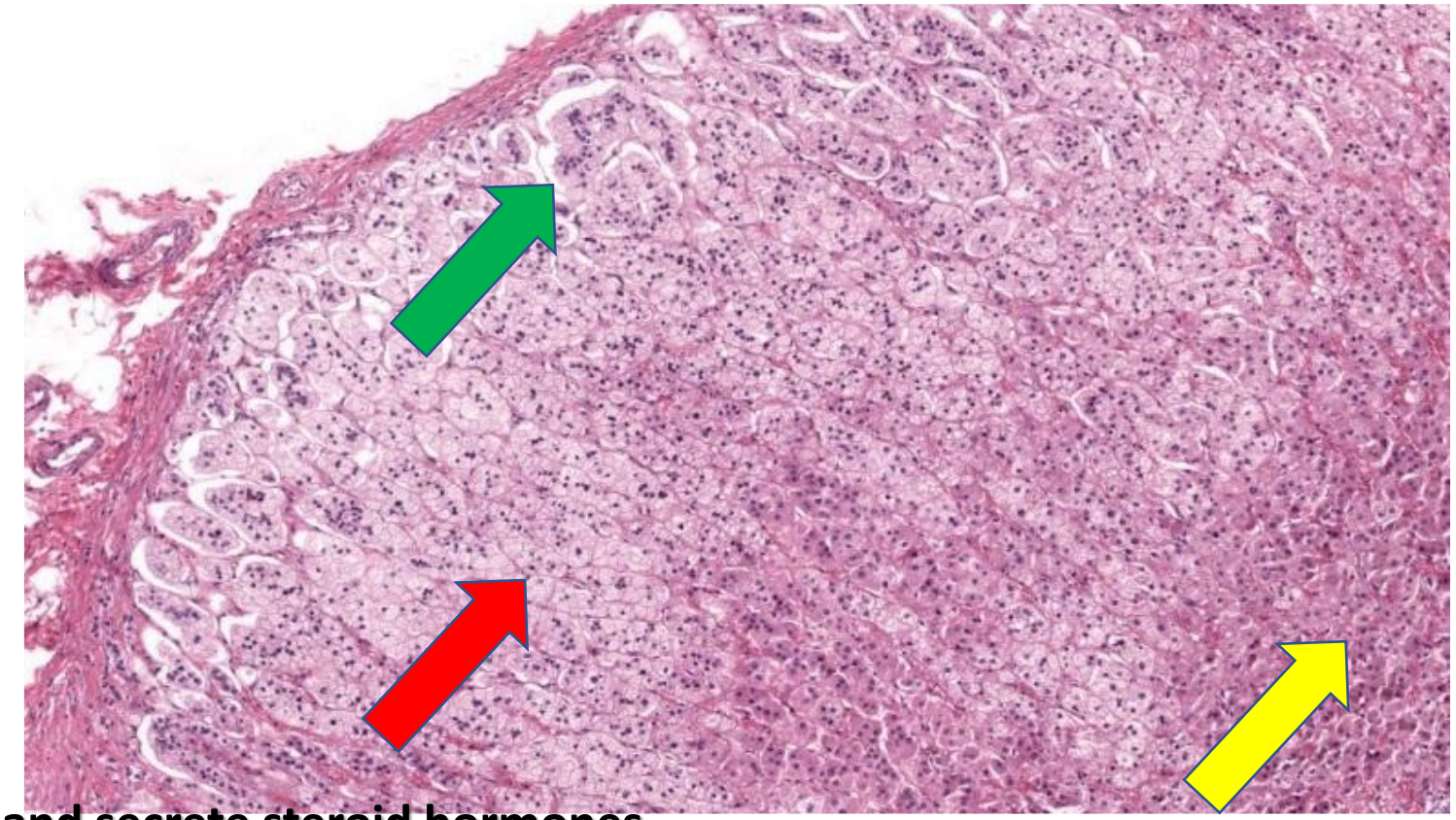


Stroma

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:

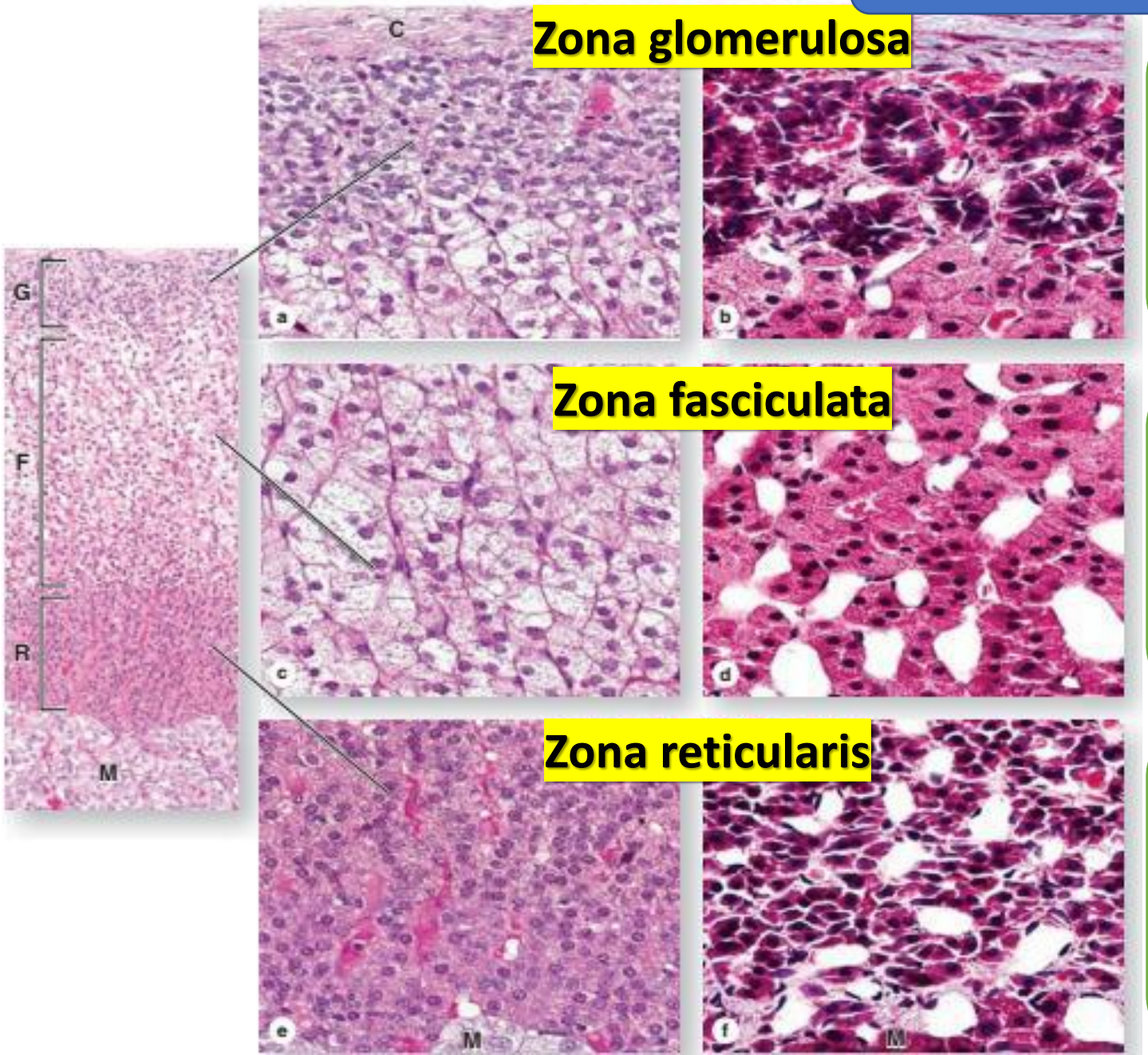
Cortex: cells that synthesize and secrete steroid hormones.

1. Zona Glomerulosa: outer zone (15%). Glomerular-like clusters of cells. The cells have a central nucleus. Cells secrete *mineralocorticoids (Aldosterone).*

2. Zona Fasciculata: middle zone (65-80%). Two-cell wide vertical cords. The cells have a central nucleus and lipid filed (foamy) cytoplasm. Cells secrete *glucocorticoids (cortisol).*

3*. 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.

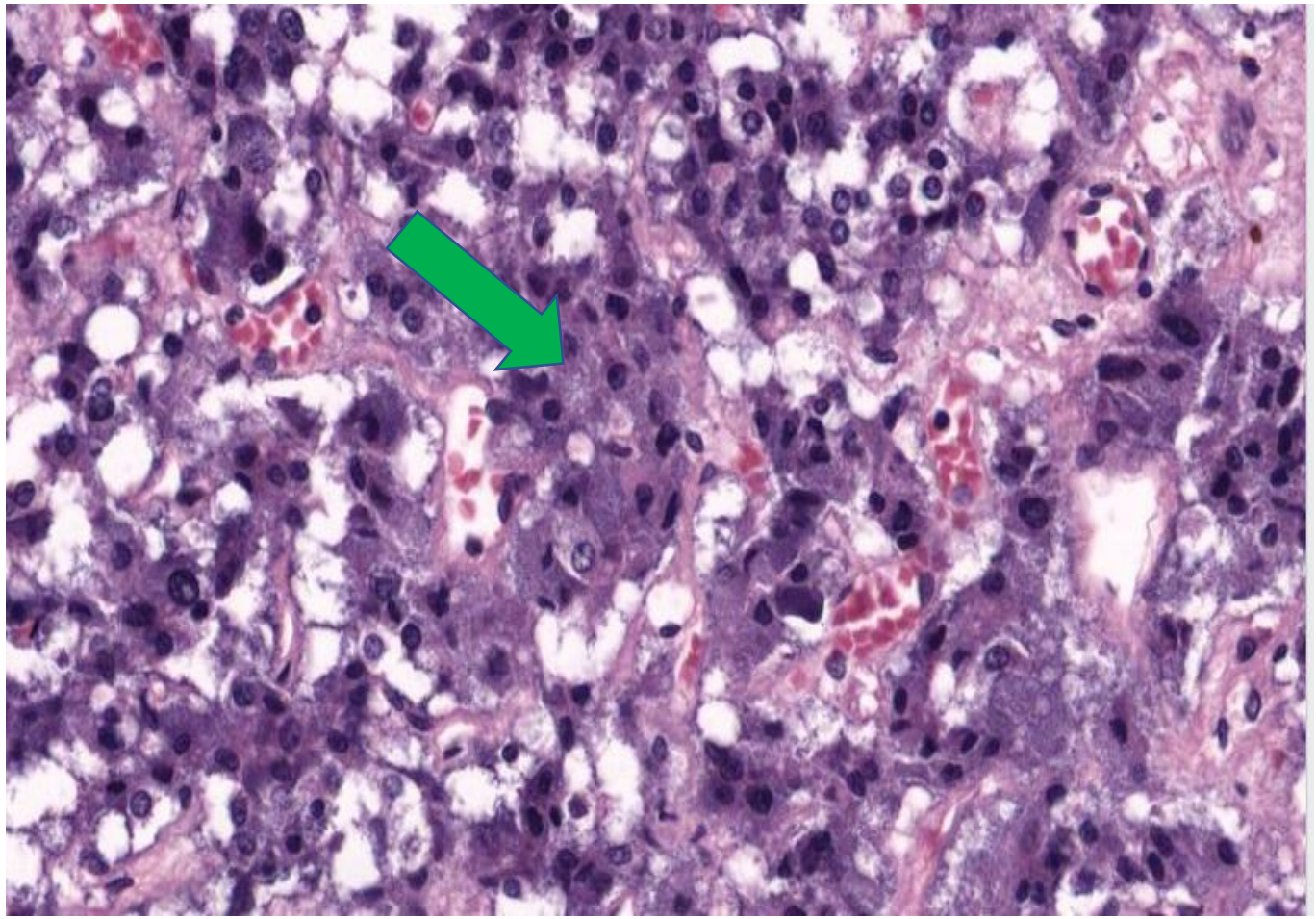
Zona fasciculata

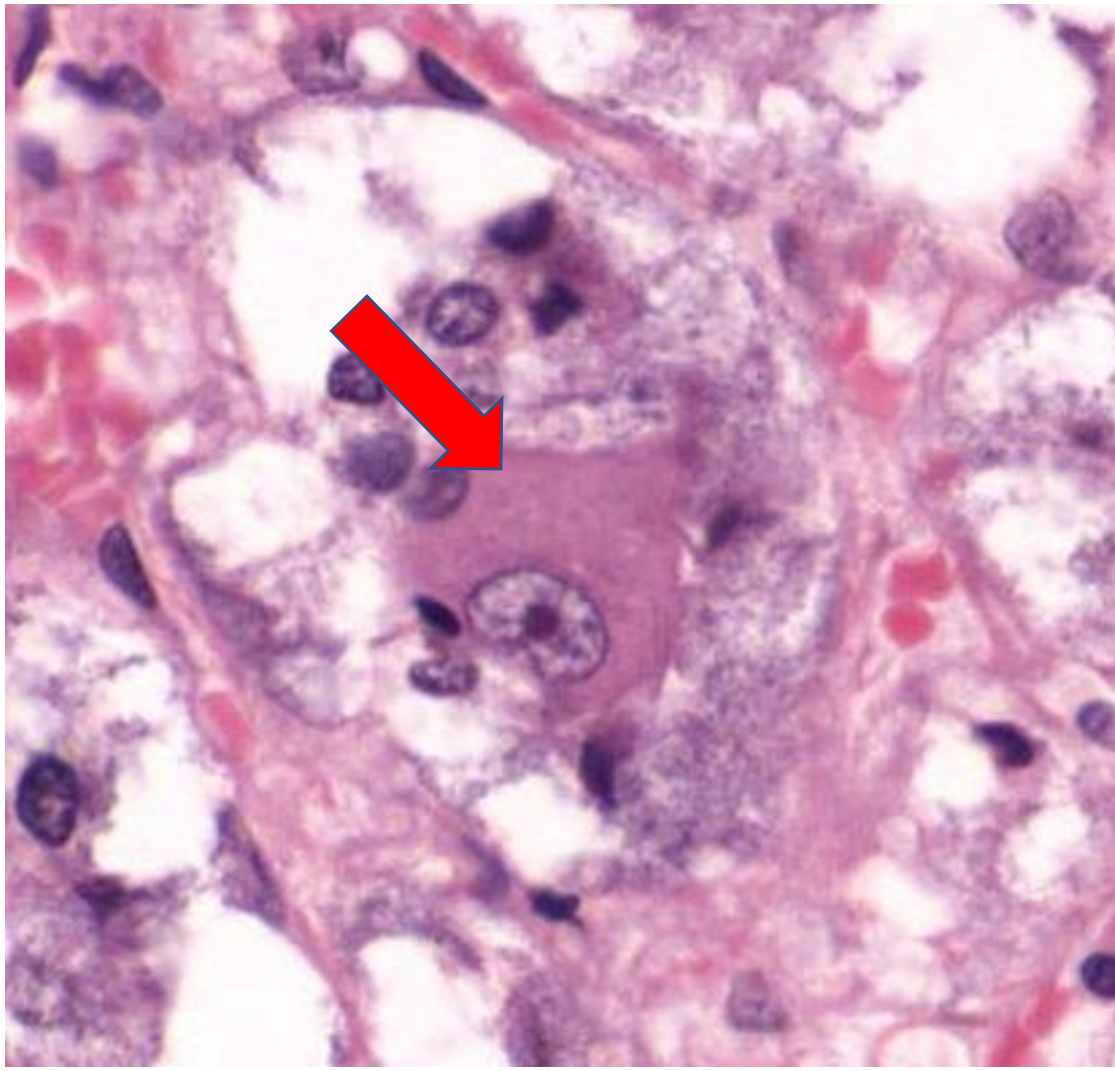
Long cords of large polyhedral cells, one or two cells thick, separated by fenestrated sinusoidal capillaries. The cells are filled with lipid droplets and appear vacuolated.

Zona reticularis

Smaller cells in a network of irregular cords interspersed with wide capillaries.

Adrenal Gland

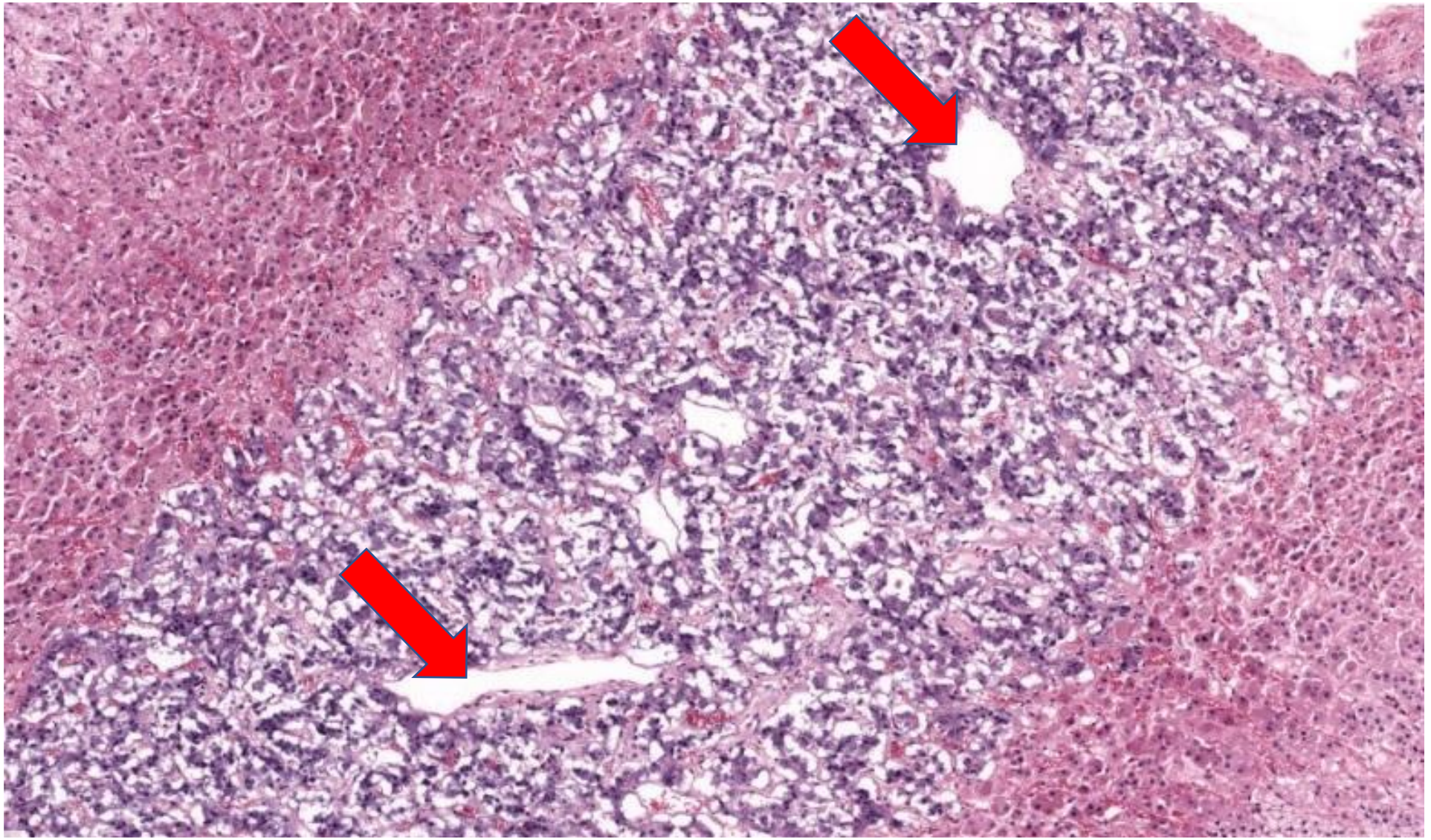




Parenchyma : Medulla:

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

Pancreas



Parenchyma:

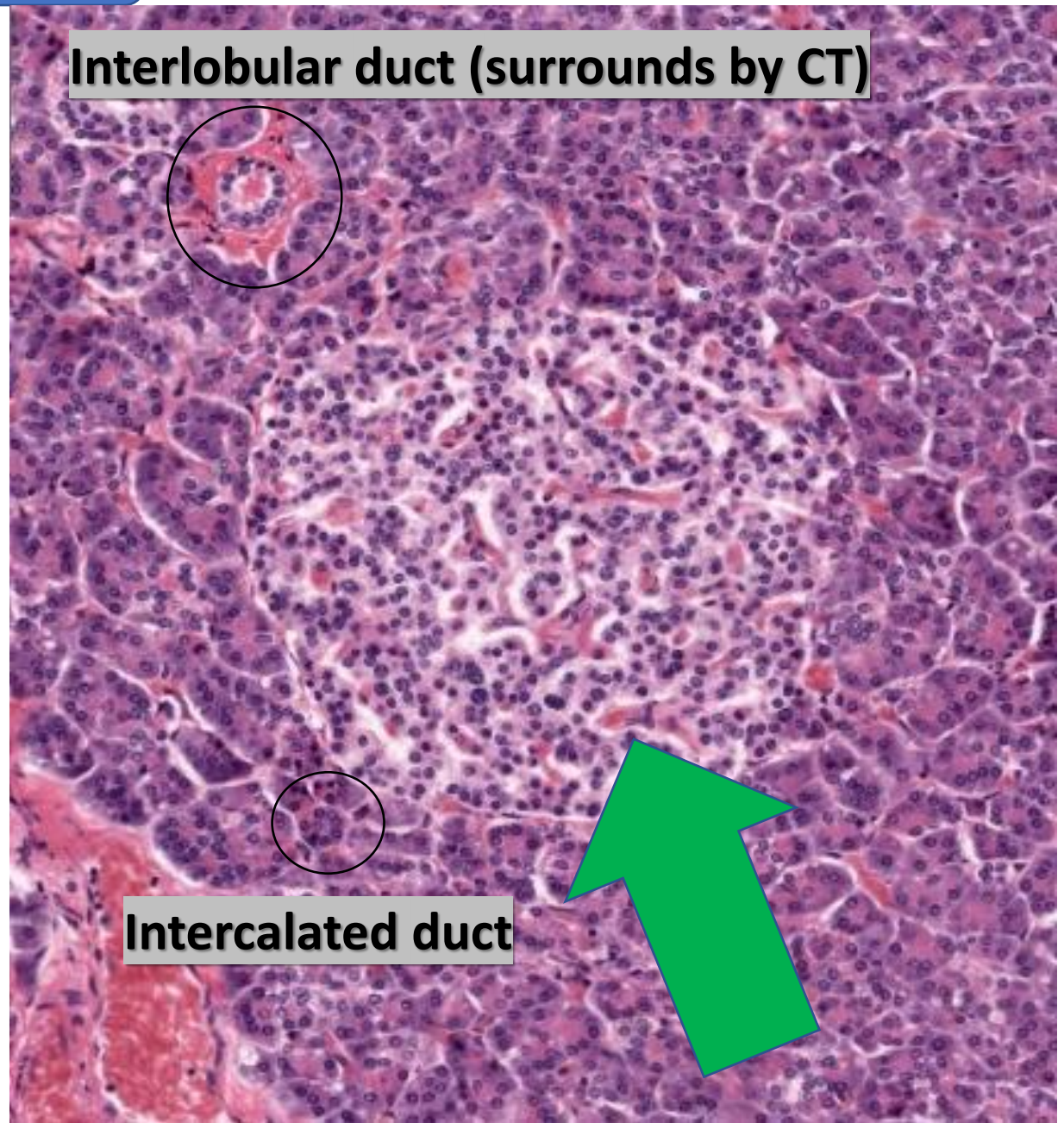
Medullary Vessels: large veins that drain the organ.

Adrenal Gland

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.

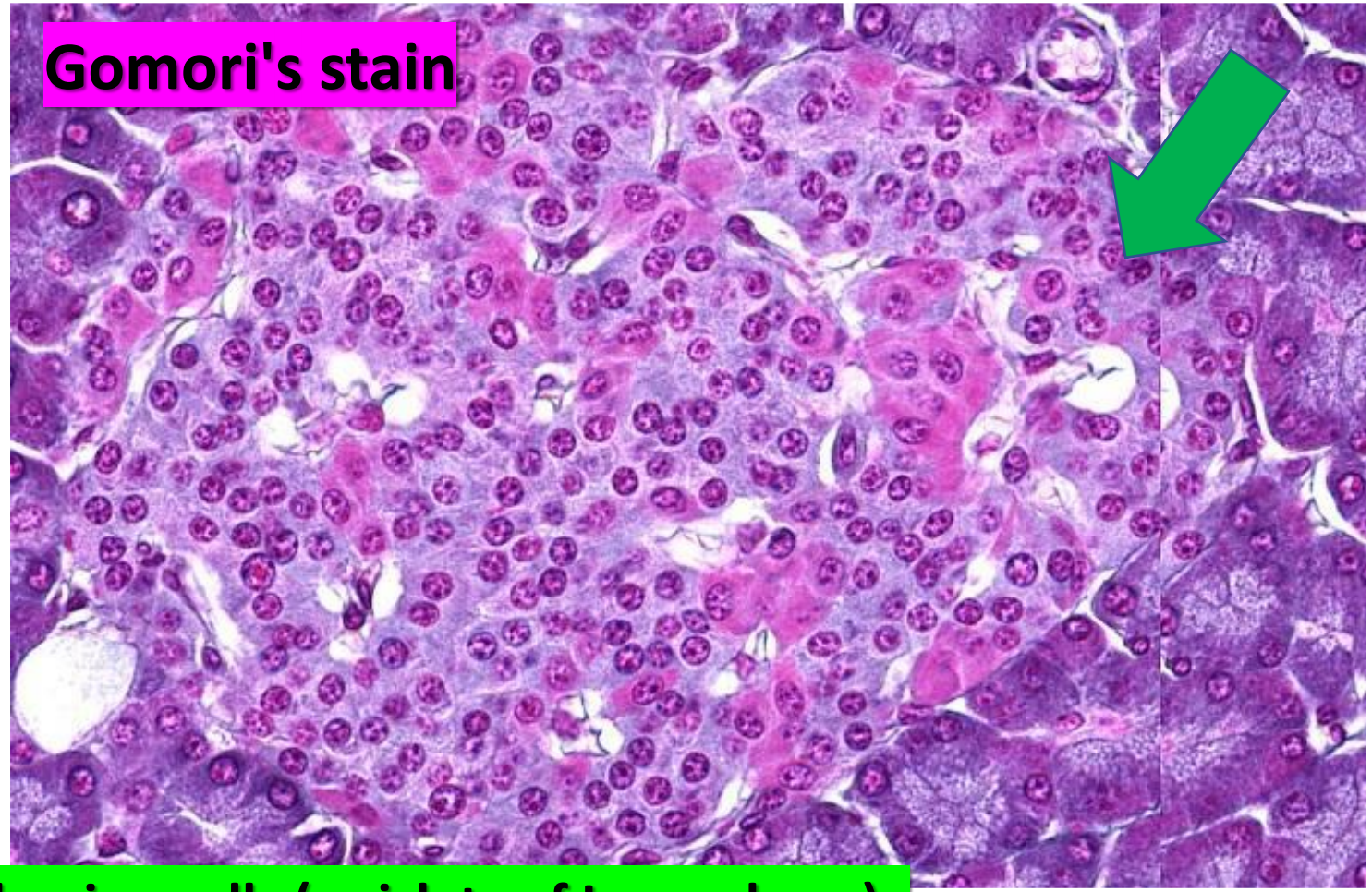


Pancreas

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

- ✓ **Aldehyde fuchsin stains insulin in the beta cells of islets of Langerhans a dark purple**

Pancreas



”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.**