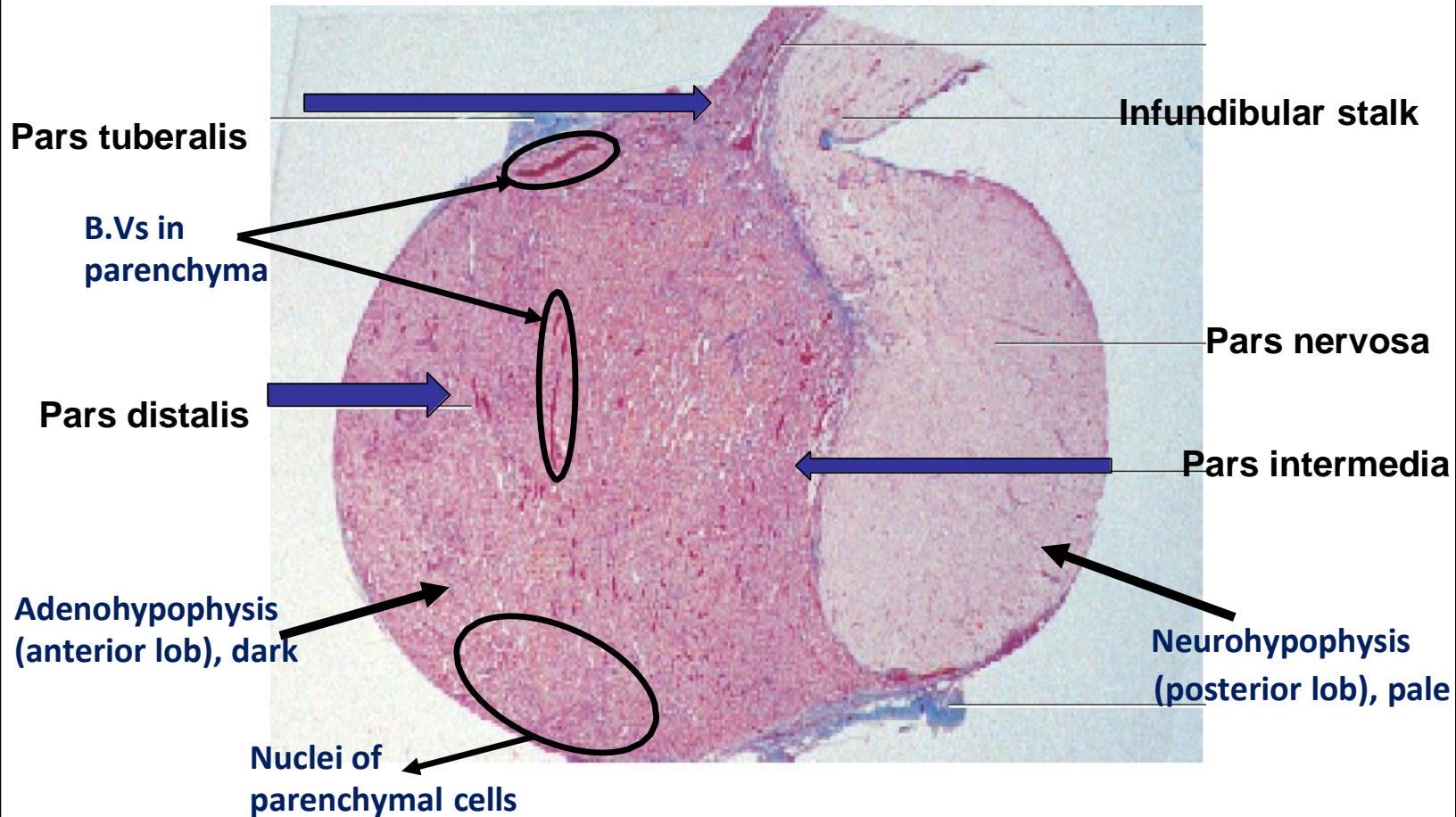
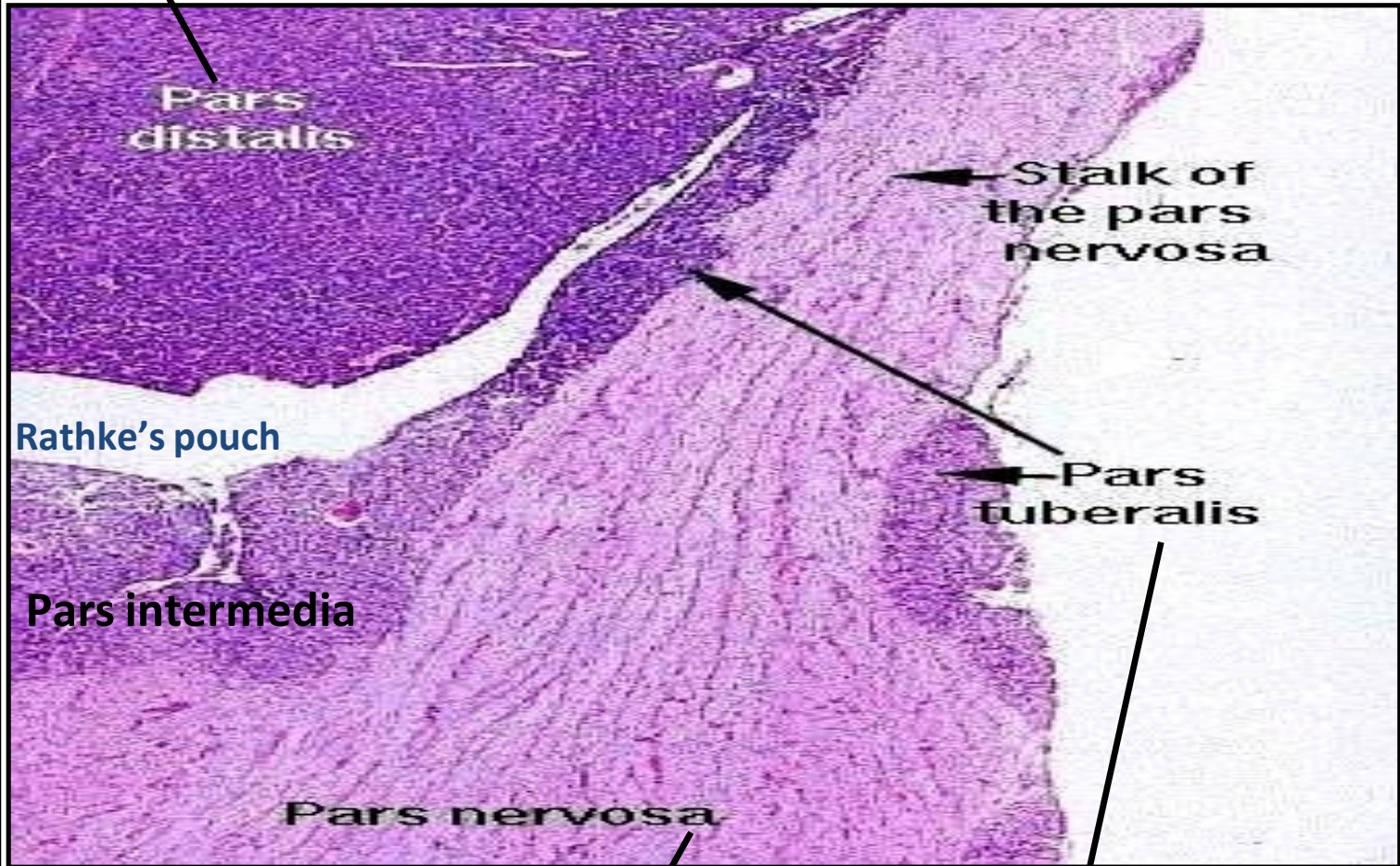


PITUITARY GLAND



Full of cells

PITUITARY GLAND



Pars distalis

Stalk of the pars nervosa

Rathke's pouch

Pars tuberalis

Pars intermedia

Pars nervosa

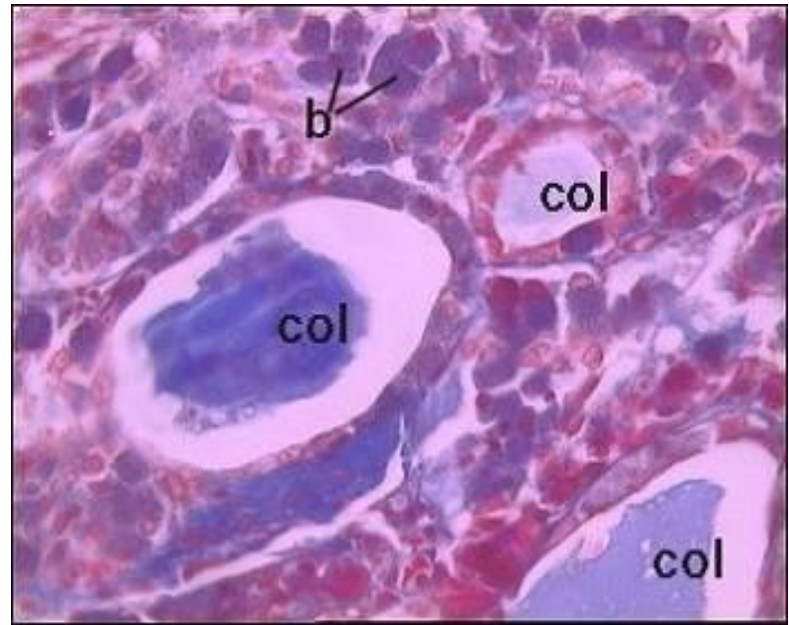
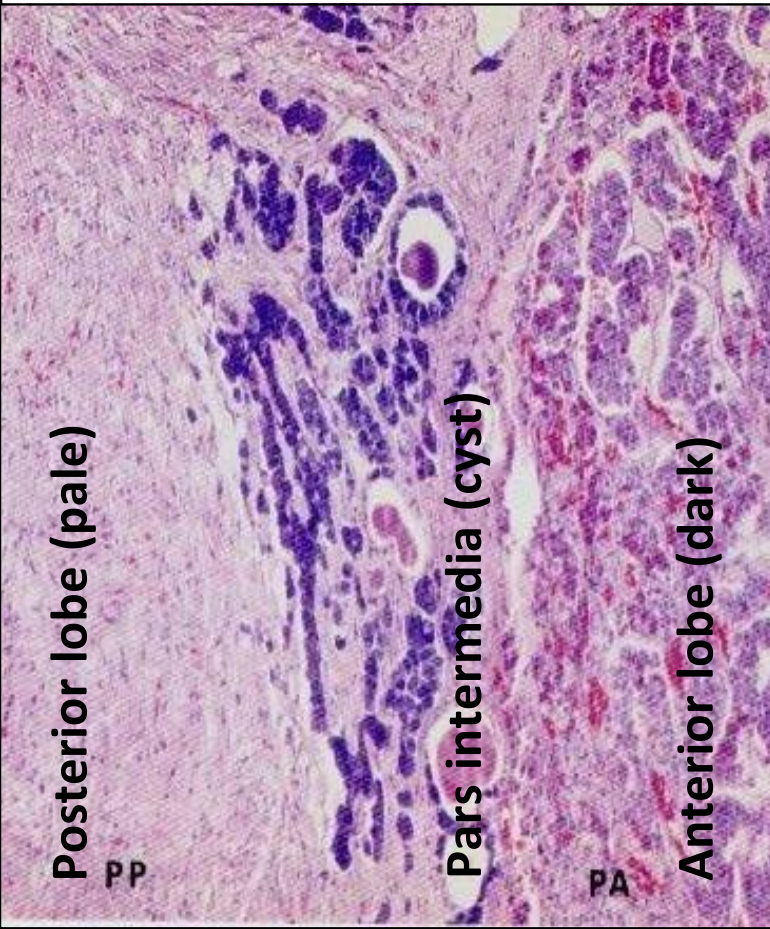
Pale, full of fibers (unmyelinated axons) come from supraoptic + paraventricular nuclei to transmit neuro secretions

Highly vascular region containing the veins of the hypophyseal portal system and wraps the infundibulum. Contain chromophobes

Pars Intermedia

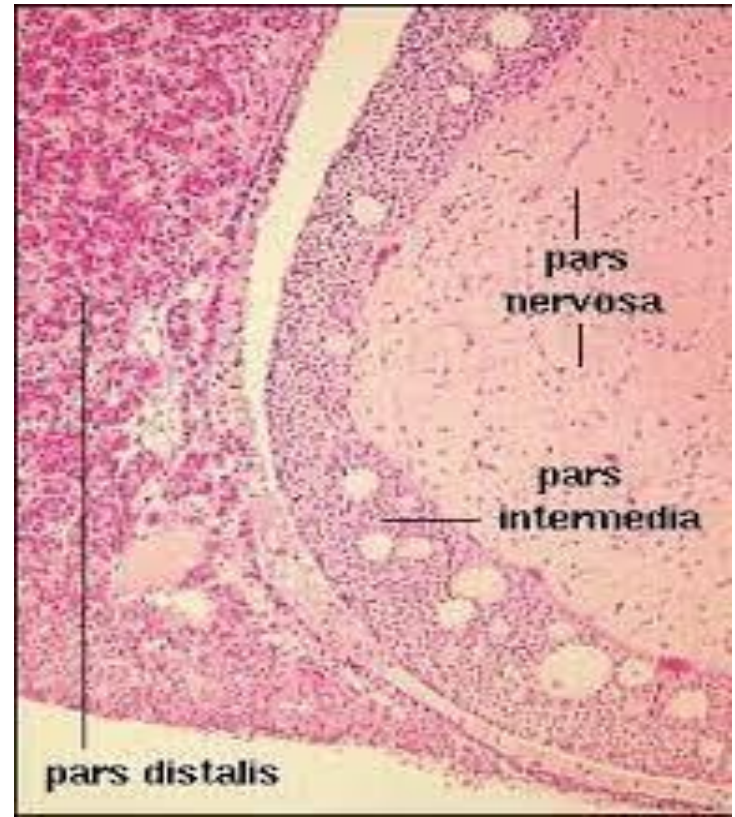
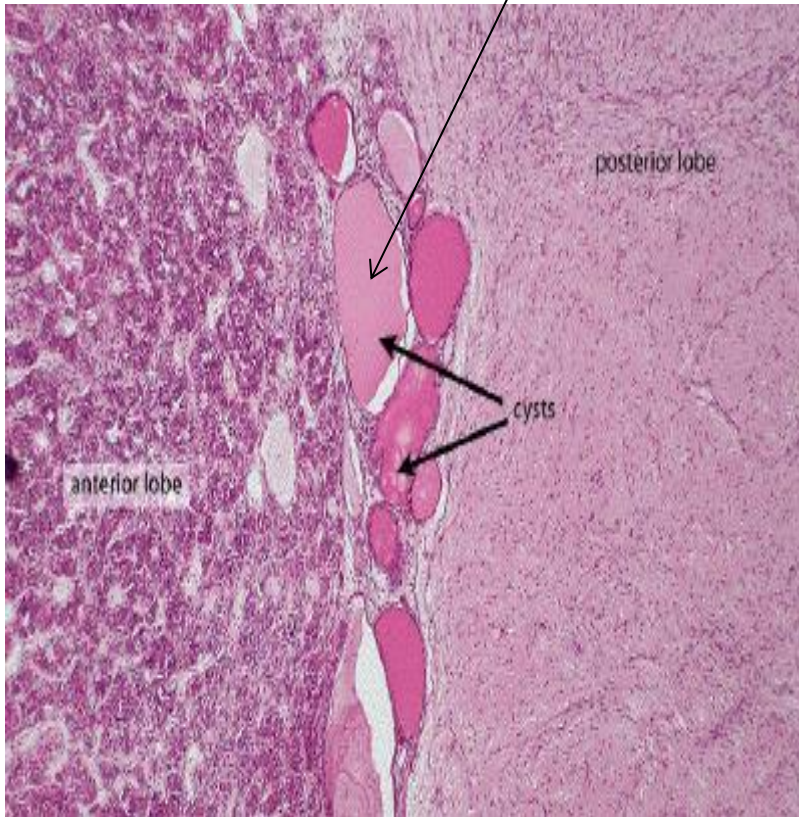
Pars intermedia in animals (presence of colloid)

- Human/ **unclear function (rudimentary)**
- animals / the basophilic cells produce melanocyte stimulating hormone (**MSH**)



Pars Intermedia

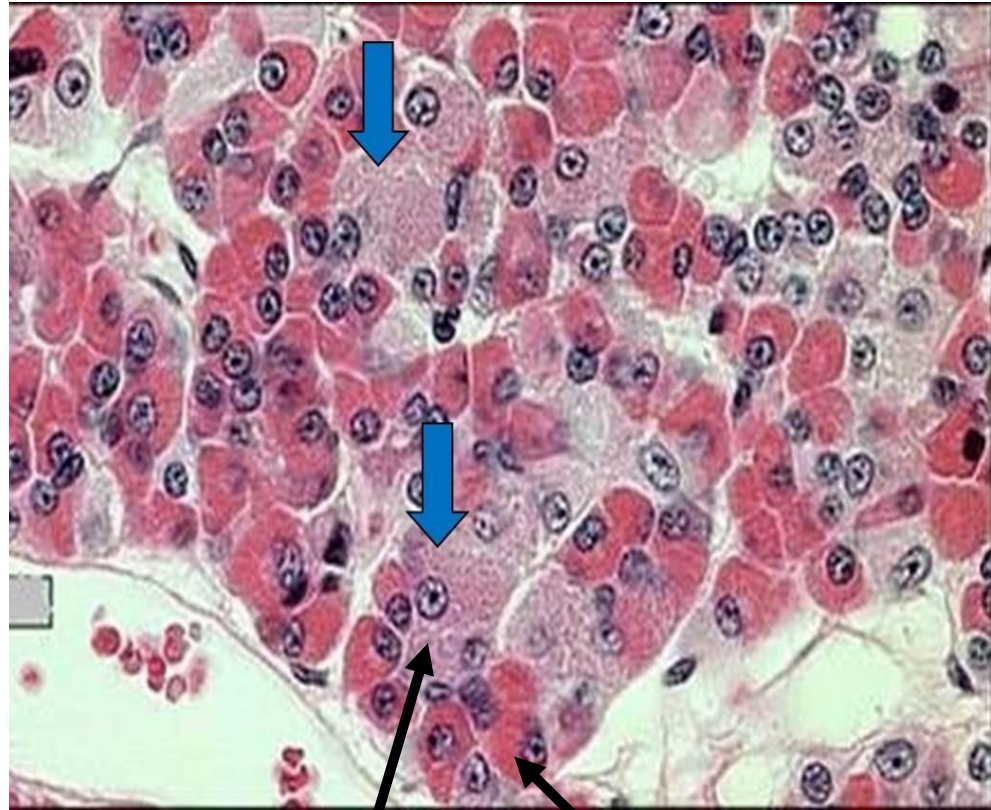
found in animals



Pars distalis =adenohypophysis

Chromophils

- 1 Acidophils 37%
- 2 Basophils 11%
- 3 Chromophobes 52%
mostly found in pars tuberalis
- 4 Fenestrated sinusoids



Basophil

Acidophil

Acidophils

- **Somatotrophs**

- Growth H.

- **Mammotrophs**

- Prolactin

- Small in ♂ and non preg ♀

- Large irregular in pregnant and lactating ♀ (Erdheim cells)

- Crinophagy:

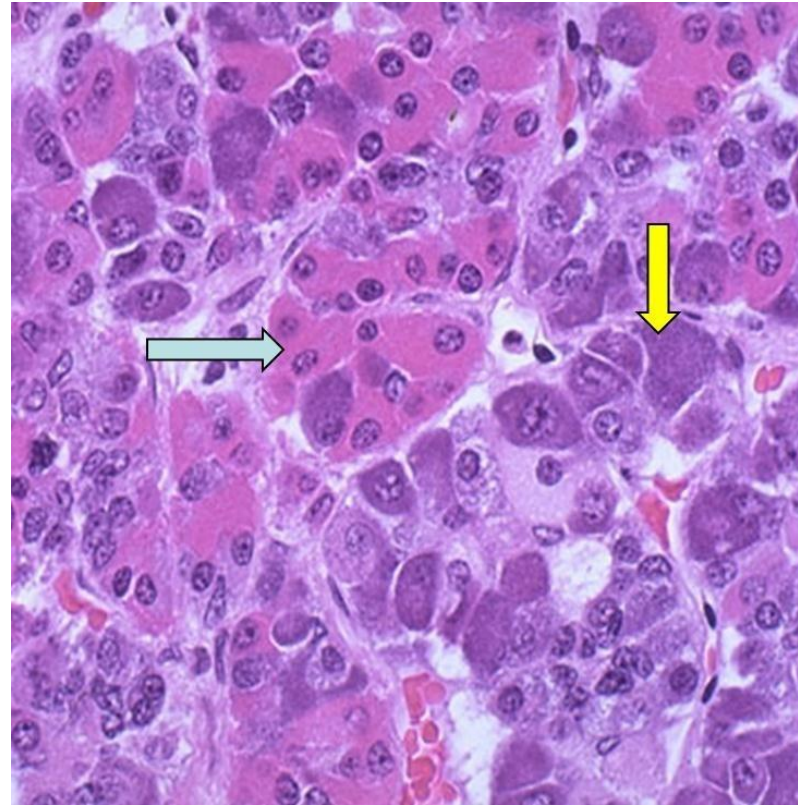
when suckling is terminated, lysosomes eliminate the excess secretory granules

Basophils :

- TSH

- FSH, LH

- ACTH



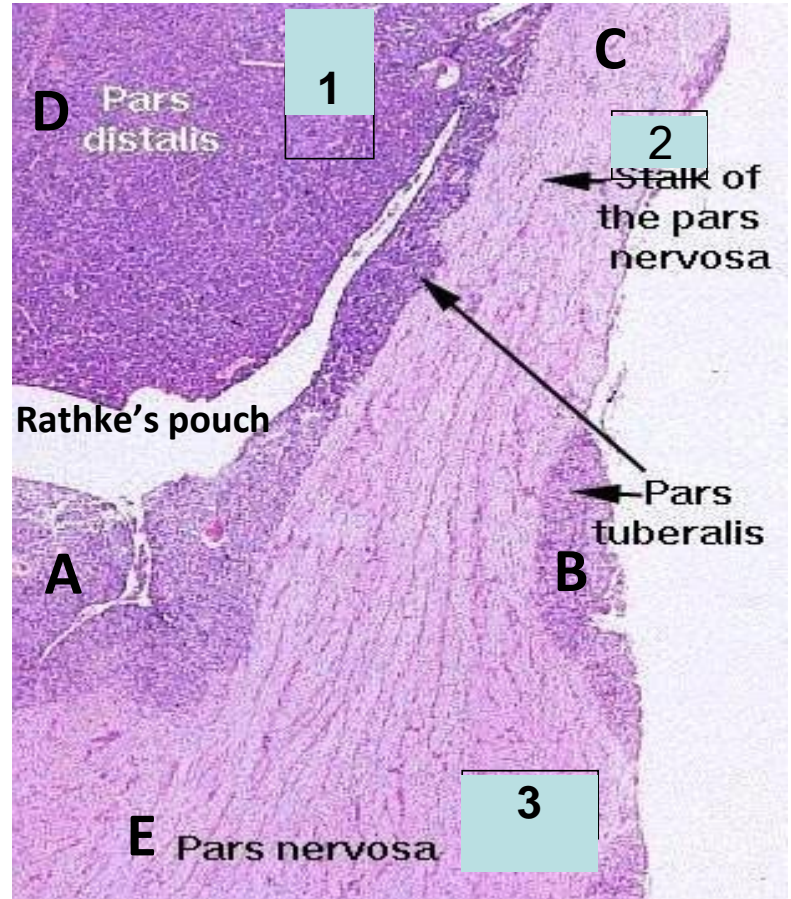
→ Acidophil

↓ Basophil

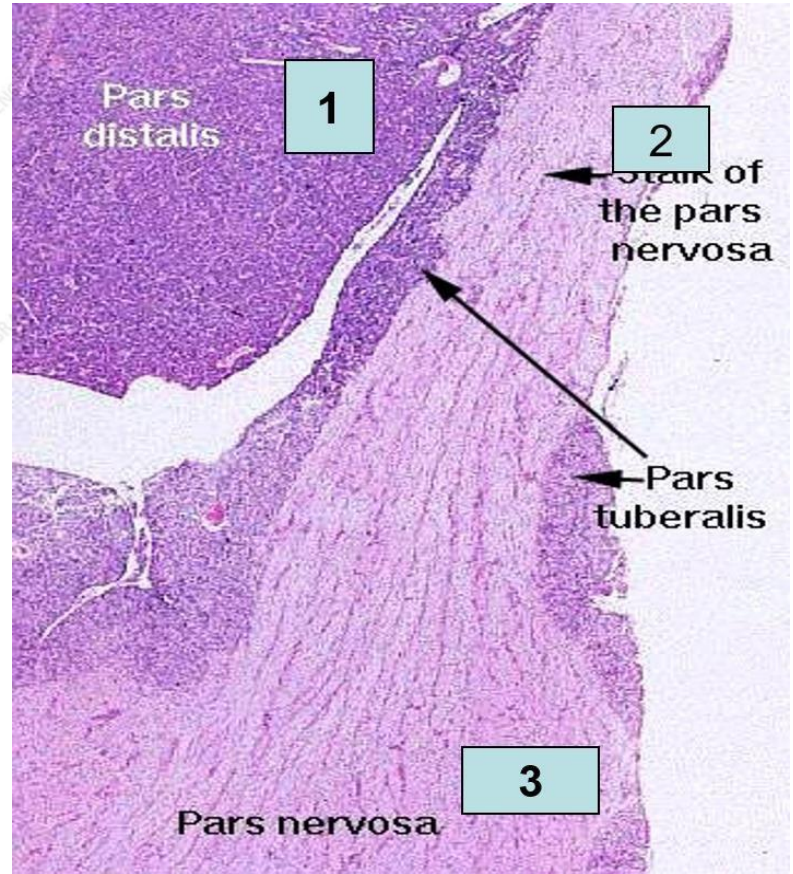
السؤال: بتجيب صورة عادية زي اللي فوق و بتأشر على وحدة من
لاخلايا وبتحكيك شو بتفرز هاي لاخلية بدون ما تحكي اسمها, فلما افروض
هن عارفين اسم الخلية وشكلها وشو بتفرز. الخلايا الحمضية في الها نوعين
لنوع بفرز هرمون, والخلايا القاعدية الها 3 انواع وكل نوع بفرز هرمون

Where is oxytocin stored ?

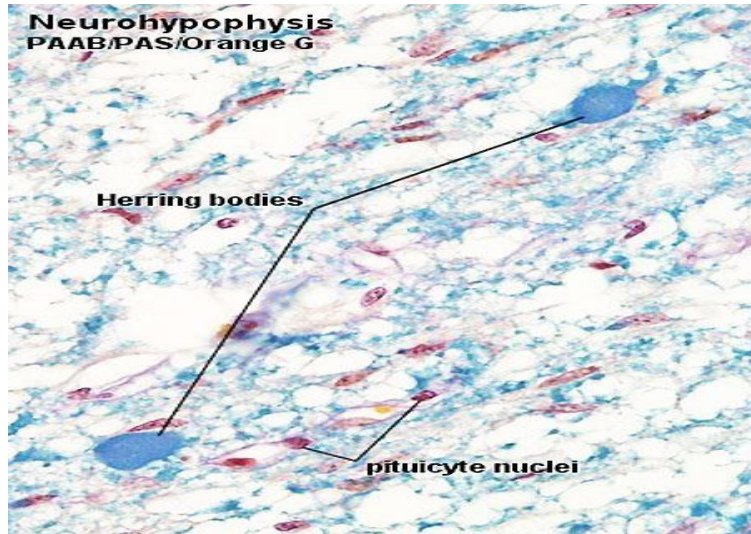
- a. Pars intermedia
- b. Pars tuberalis
- c. Infundibulum
- d. Pars distalis
- e. Pars nervosa



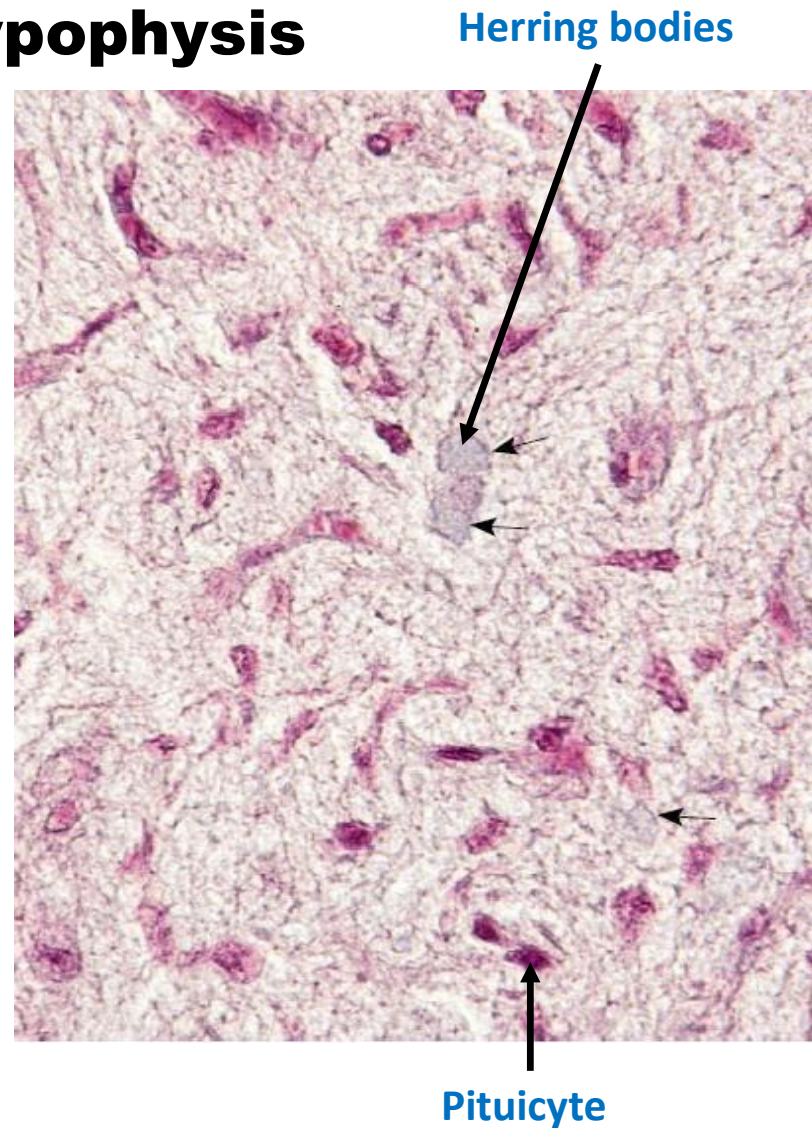
Neurohypophysis



Neurohypophysis

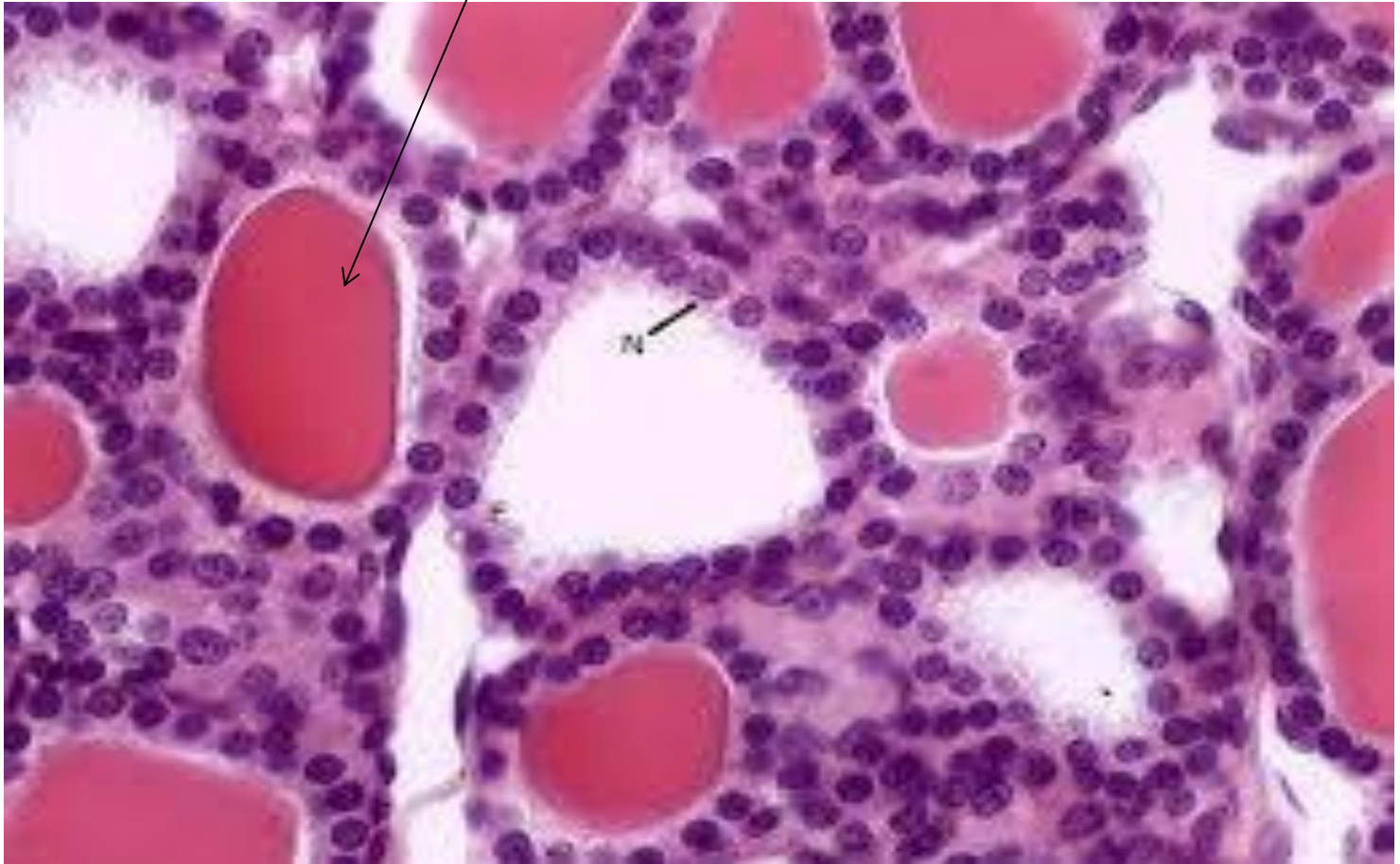


1. **Unmyelinated** axons
2. Herring bodies (ADH, Oxytocin)
3. Pituicytes. **modified glial cells** having supportive, nutritive and insulating function
4. Rich blood capillary plexus



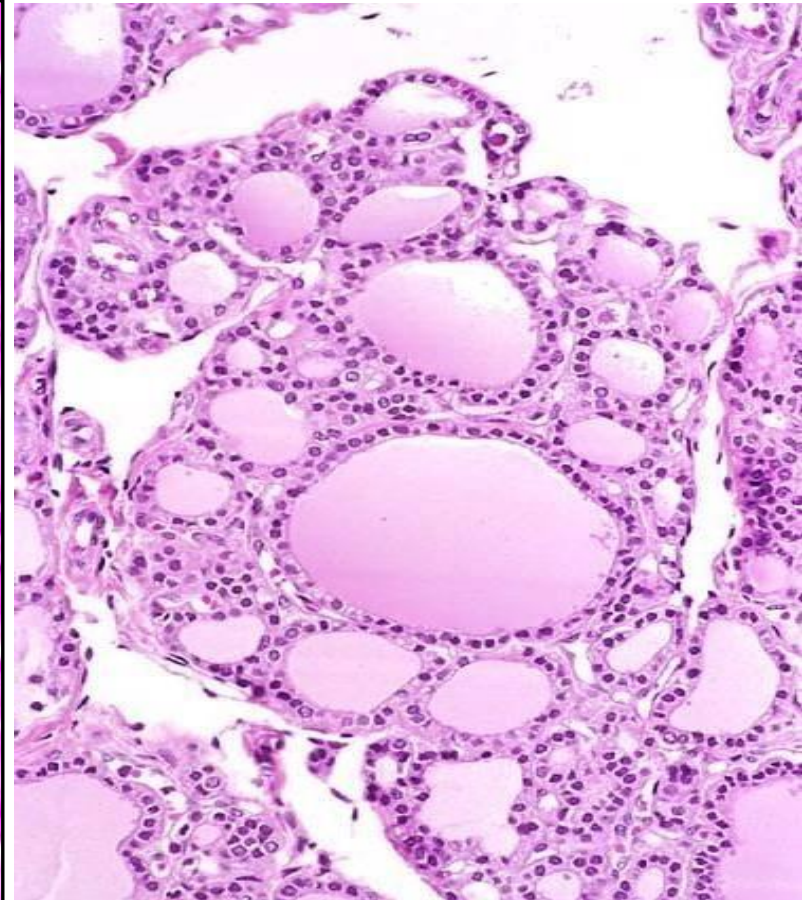
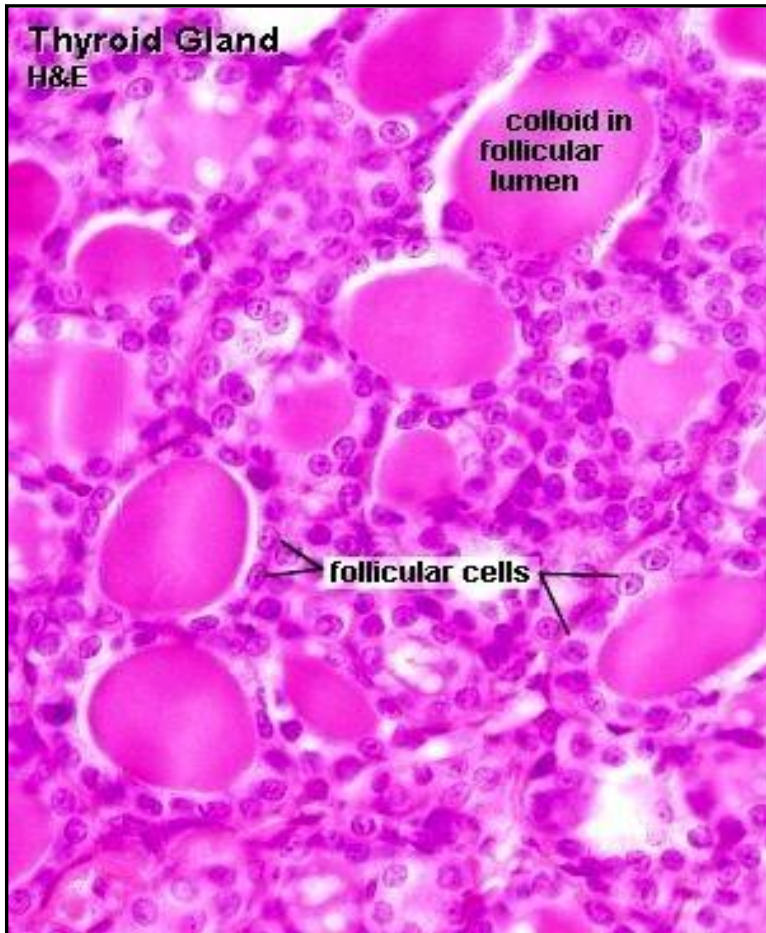
1. Follicular cells (most numerous produce T3, T4)
2. Parafollicular (clear) cells (few in num. produce calcitonin)
3. Interfollicular cell

Thyroid

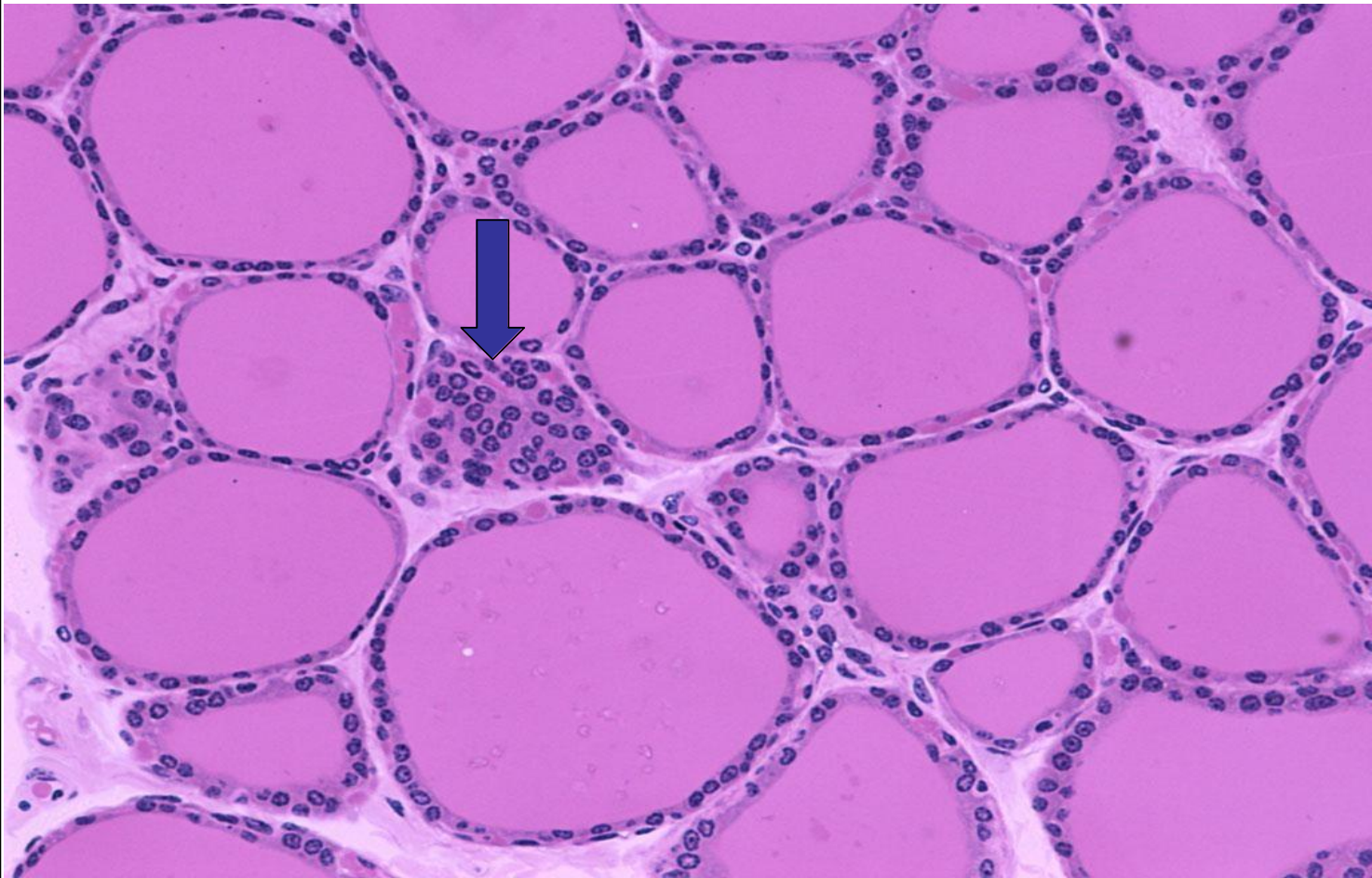


Thyroid gland → stroma is double capsule (false + true capsule), contain incomplete lobulation, cells arranged in follicles, secretion of follicular cells doesn't release directly to blood but stored in colloid until we need it, colloid released to blood by phagocytosis

Thyroid



Interfollicular cells



lining epithelium of follicular cells is cuboidal in normal state. in hypoactive state they become columnar in shape, in hyperactive state they become flattened

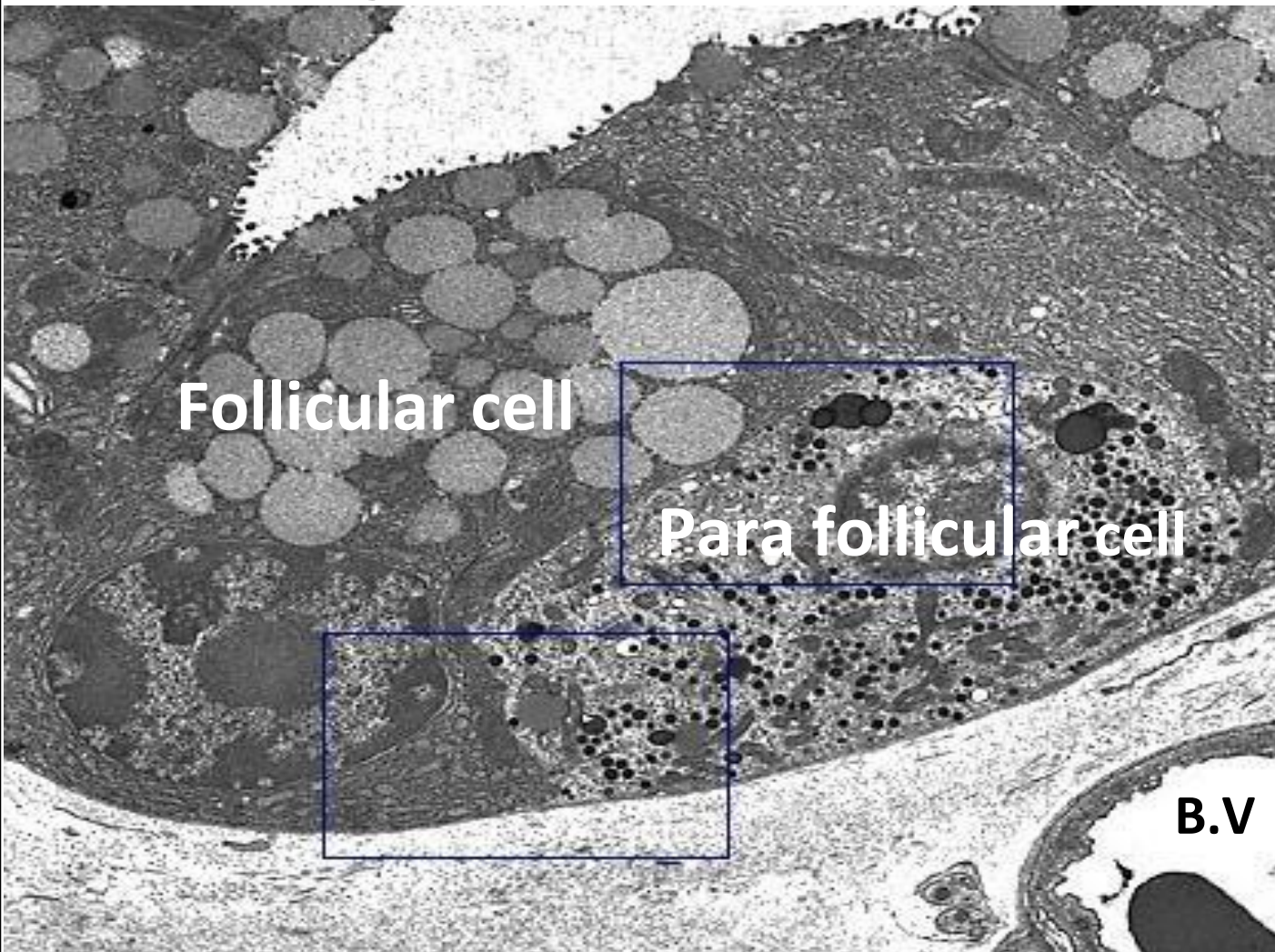
Thyroid

1. Follicular cells
 - Interfollicular cells
2. Parafollicular (clear = pale) cells



Para follicular cells

EM of thyroid follicle



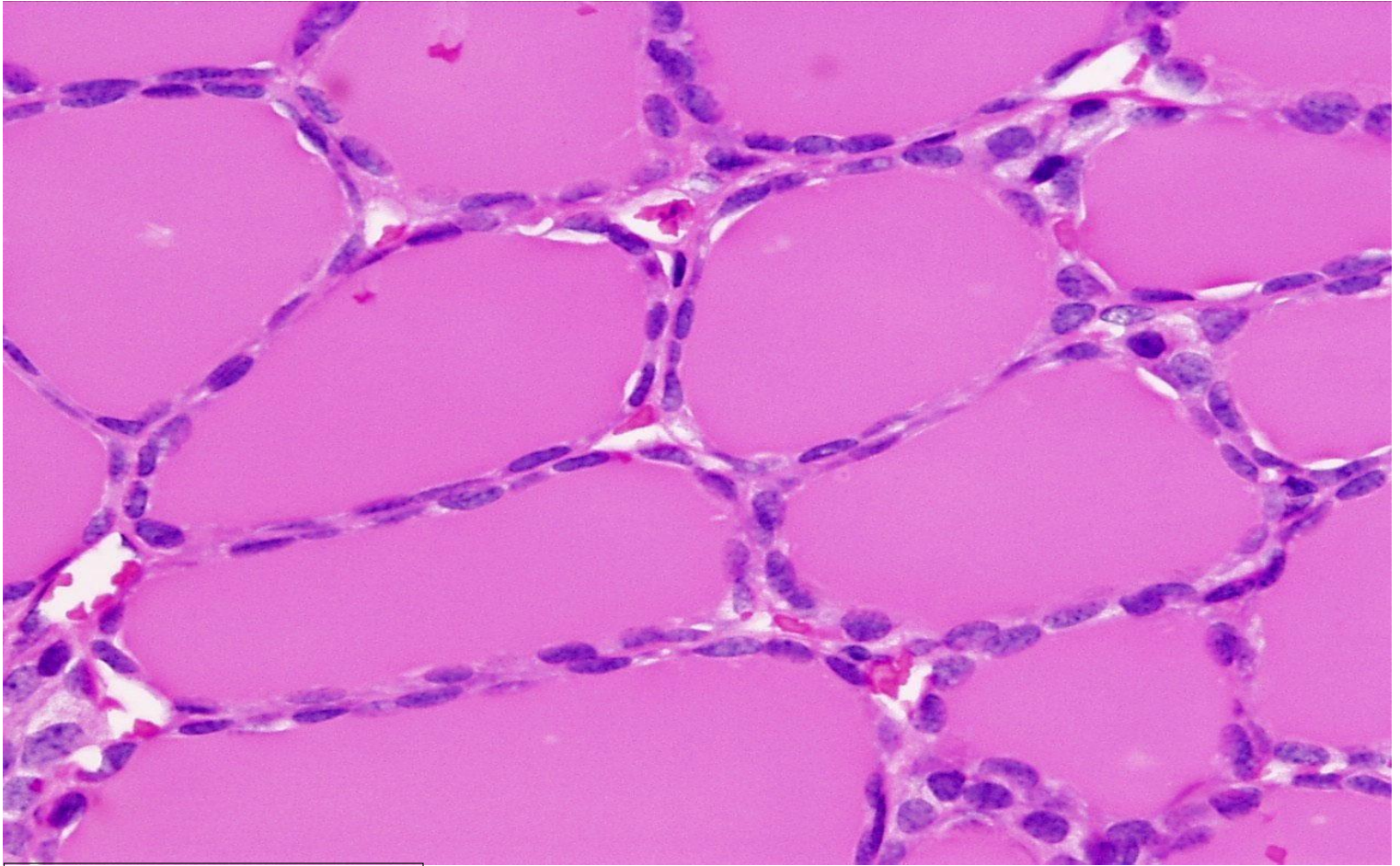
Follicular cell

Para follicular cell

B.V

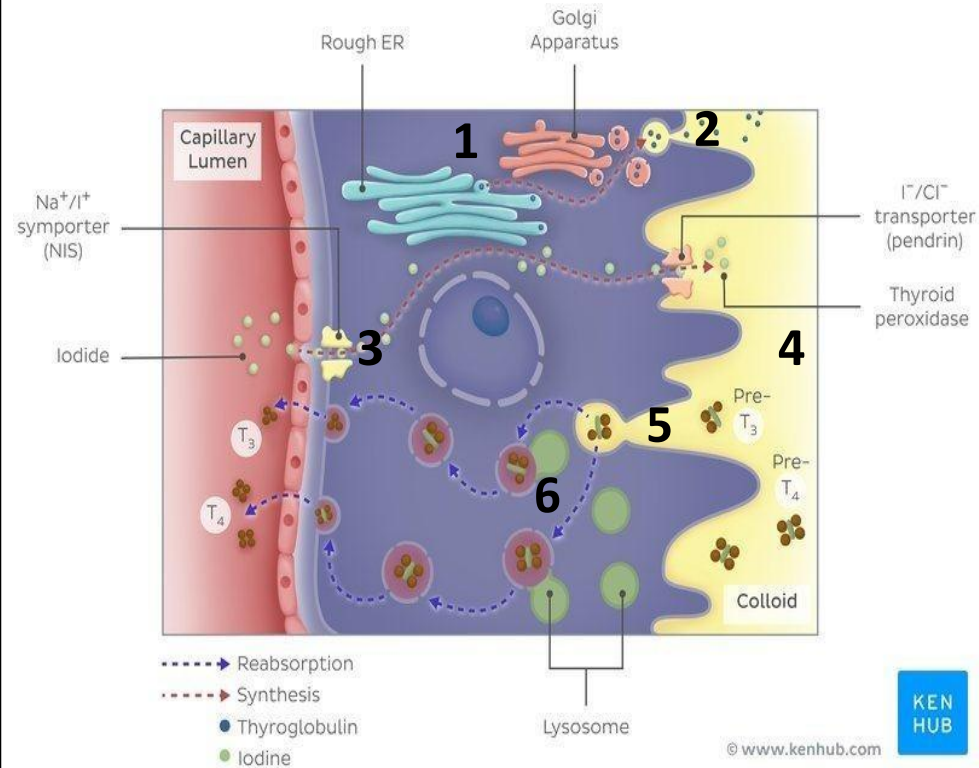
Granules of Para follicular cells present at the base near B.V to release its content directly to blood

Thyroid



Follicles of thyroid gland

Formation of thyroid hormones



1-organelles of protein synthesis produce thyroglobulin hormone (precursor)

2-Tg transmitted by exocytosis to lumen of follicles to stored as colloid

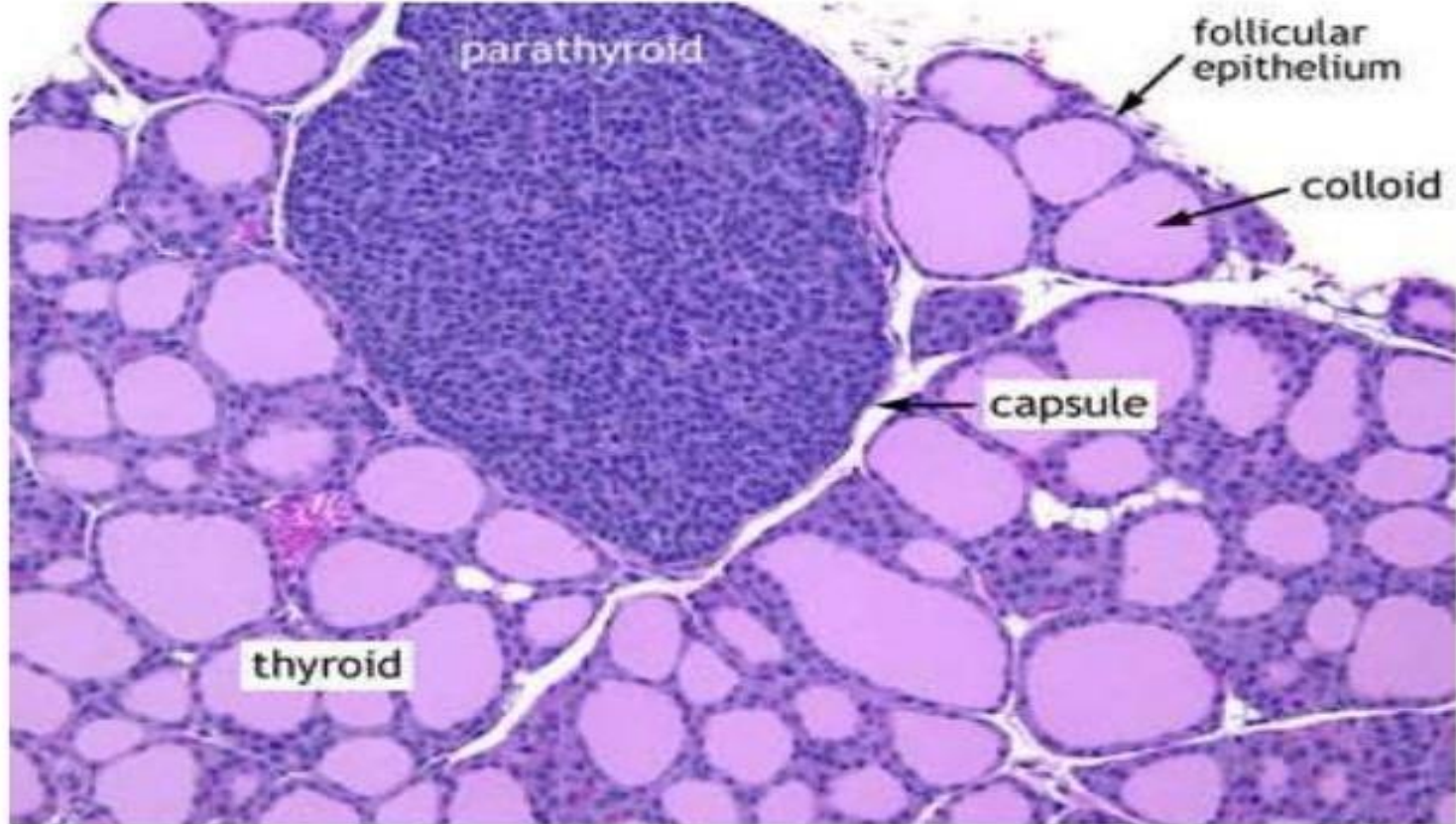
3-iodine enter from the blood → cell → lumen, to iodinate the precursor

4-iodinated Tg stored in the lumen until we need it

5-when we need it, the iodinated Tg re-enter the cells by endocytosis

6-inside cells there is numerous lysosomes which will take the precursor and break it down, then it released to blood as T₃, T₄

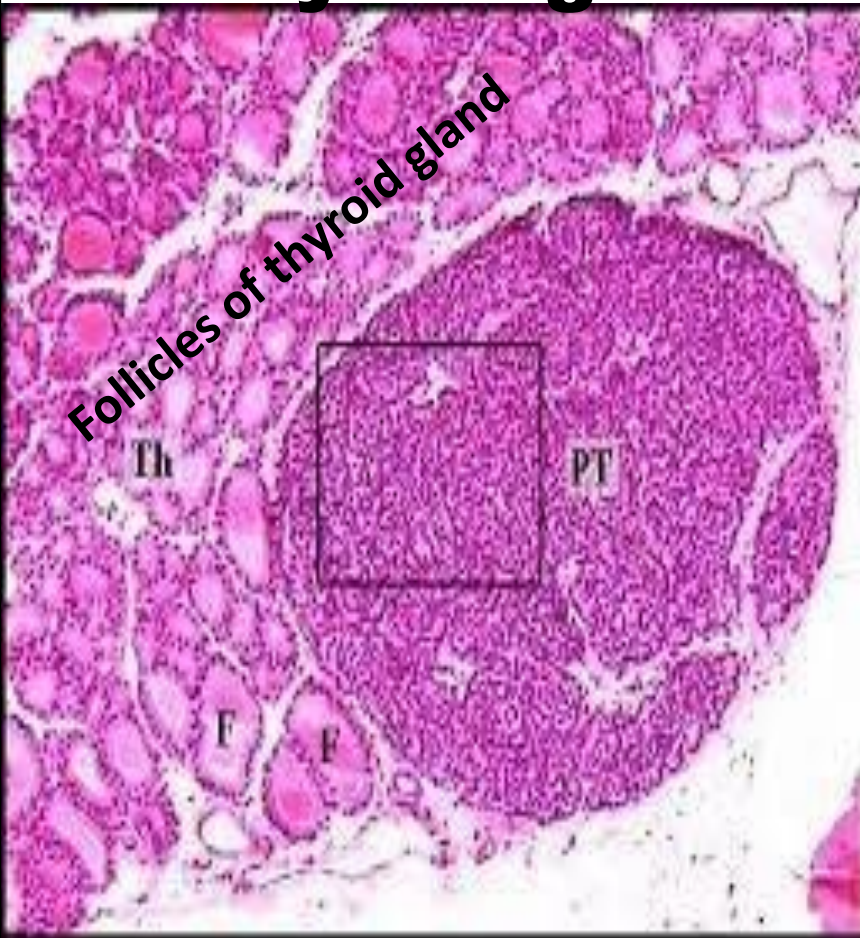
Parathyroid gland



Parathyroid cells arranged in cords separated by B.Vs

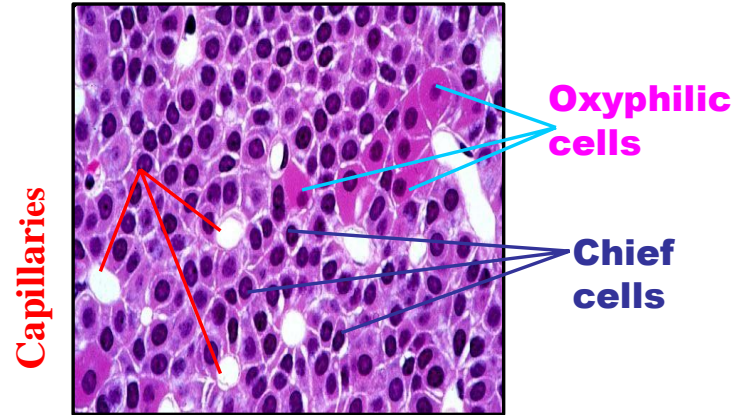
Thyroid cells arranged in follicles

Parathyroid gland



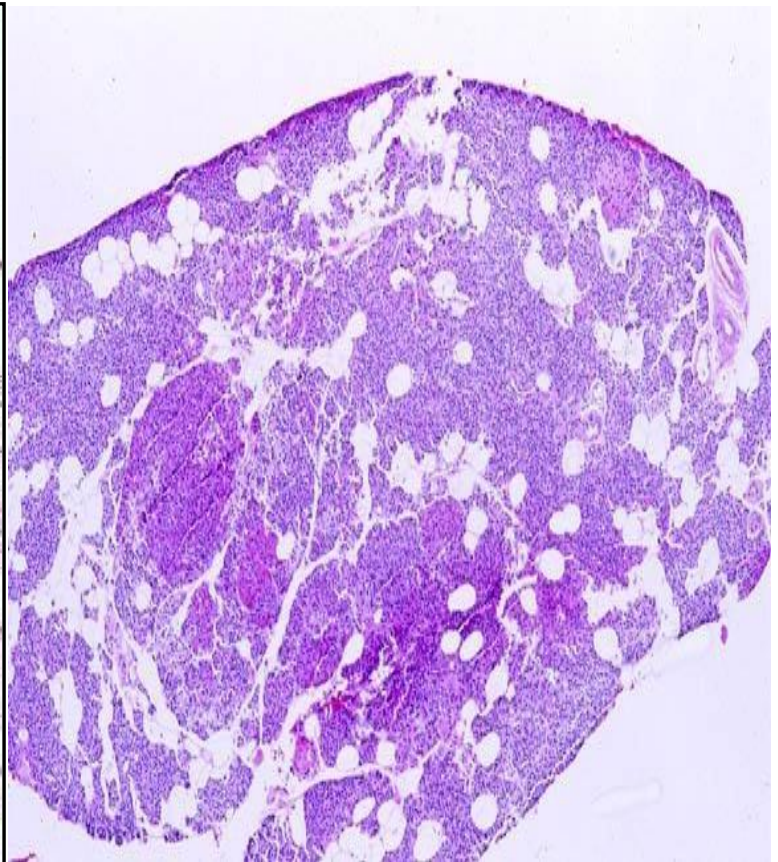
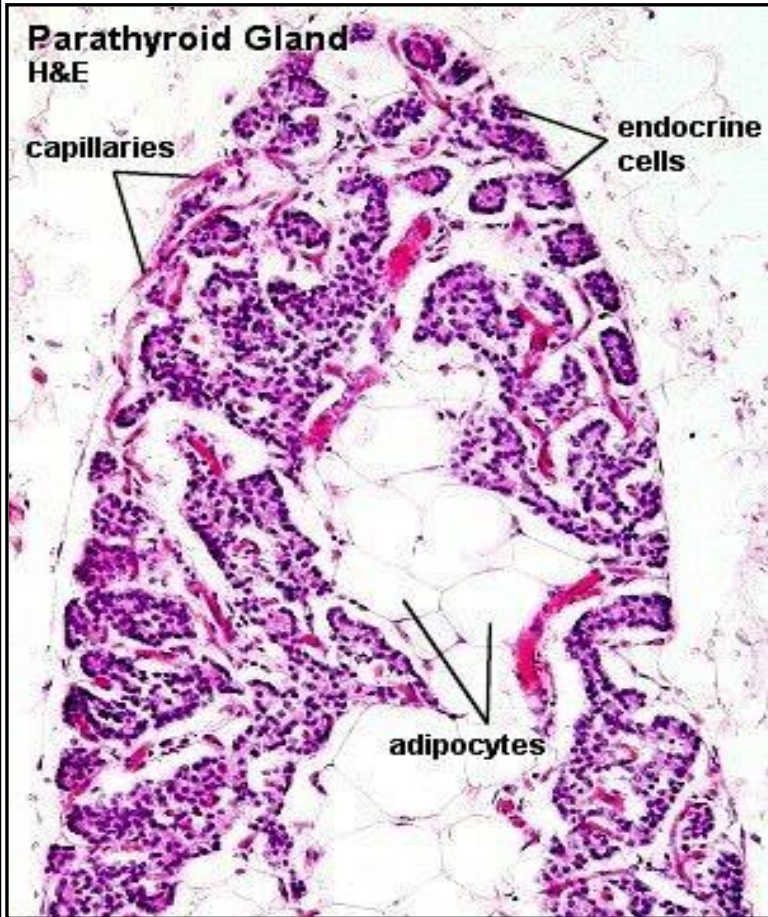
Parathyroid gland → surrounded by a thin connective tissue capsule (stroma) + cells surrounded by B.Vs parenchyma

- Two types of cells:
 1. Chief cells
 2. Oxyphil cells (degenerated chief cells)



	Chief cells (principal)	Oxyphil cells
size	Small polygonal	Large polygonal
number	numerous	few
Stain	Faint acidophilic	Deep acidophilic
nucleus	Active, Large vesicular	Inactive, Small dense
rER	More (produce hormone protein in nature)	sparse
Function	Parathyroid hormone (↑ Blood Ca level)	unknown

Parathyroid gland in old people



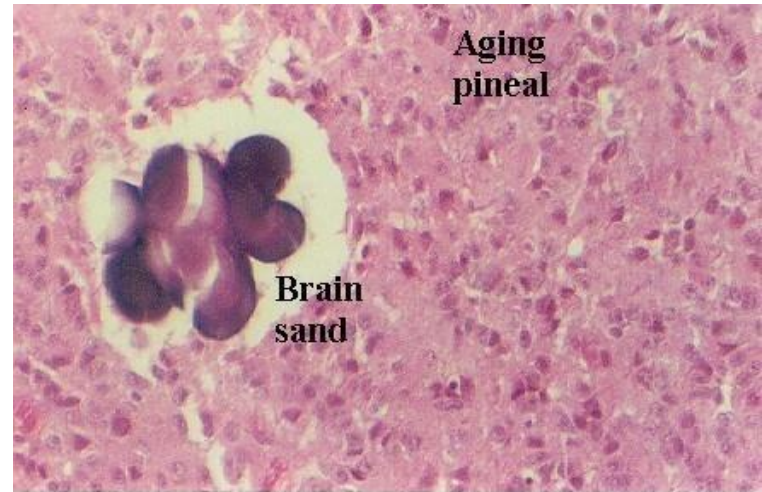
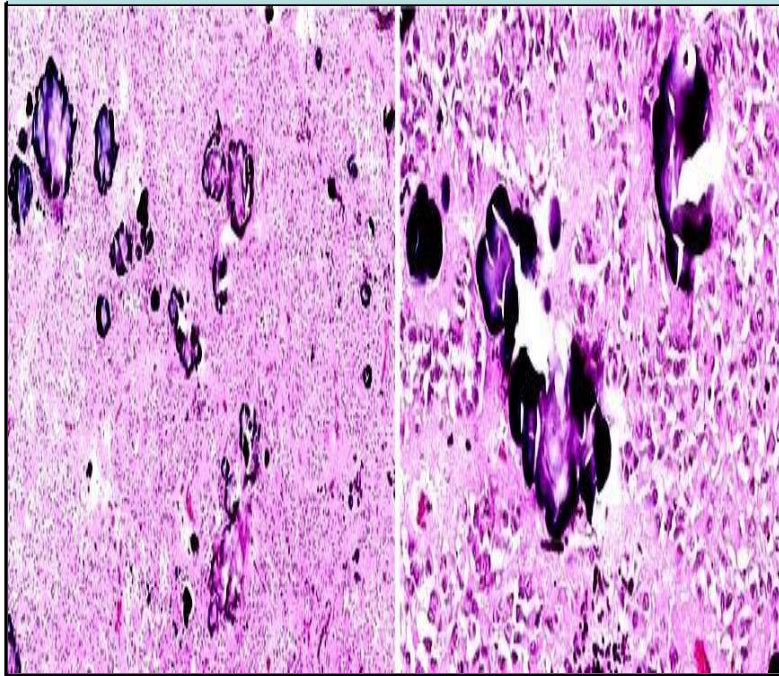
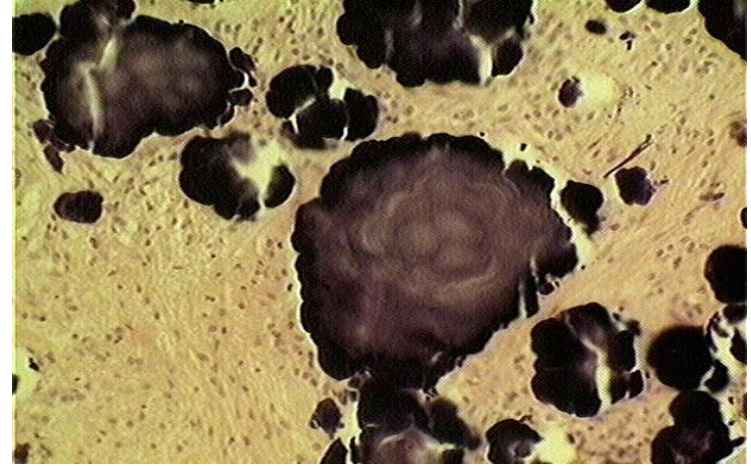
Changes that occur in the gland with age:

- 1) fibrosis,
- 2) \uparrow fat cells,
- 3) \uparrow oxyphilic cells,
- 4) \downarrow chief cells

Pineal gland (Epiphysis cerebri)

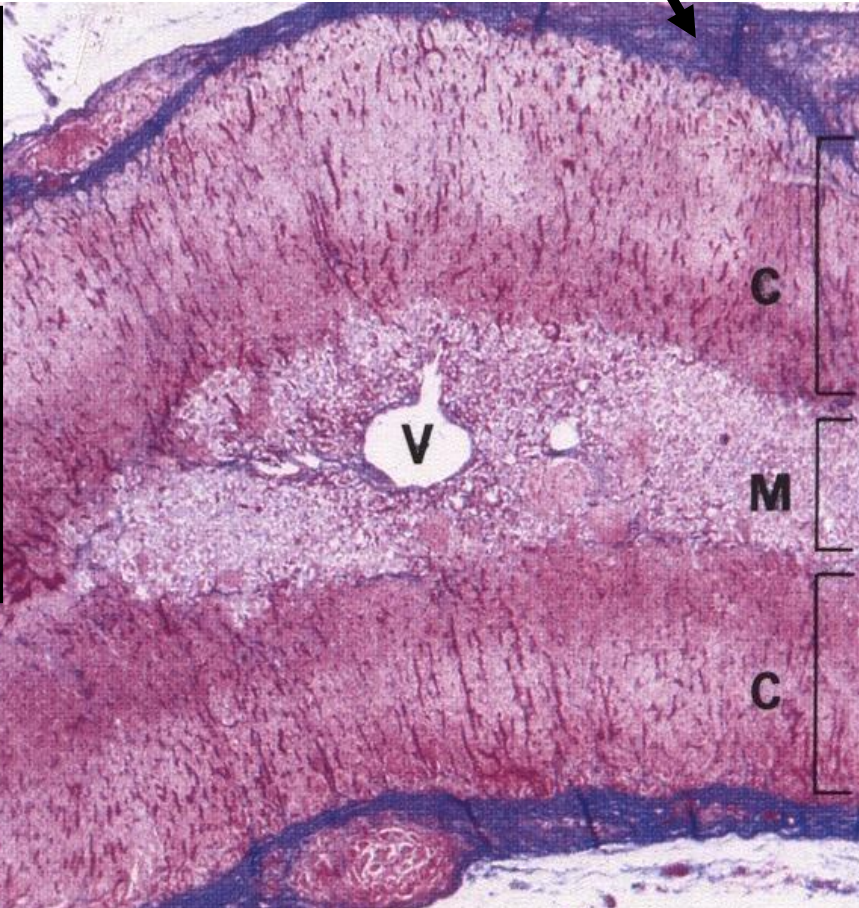
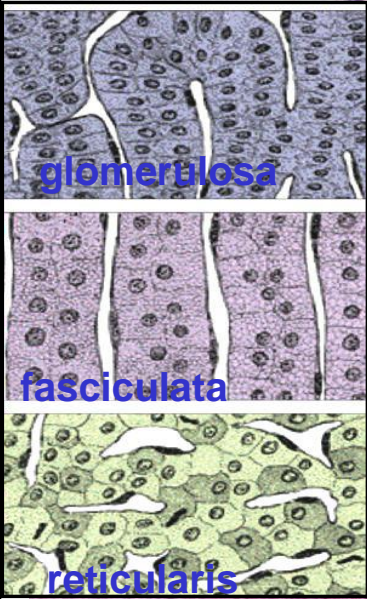
Pineal gland+ pars nervosa → nervous in origin

- 1 Pinealocytes (neurosecretory cells, secrete melatonin)
 - 2 Astrocytes (glial cells)
 - 3 Blood vessel
- ❑ **Brain sand with old age** (calcification, These are not a degenerative change; not pathological)



Suprarenal gland

Thick connective tissue capsule.



Medulla → ectodermal origin
Cortex → mesodermal origin

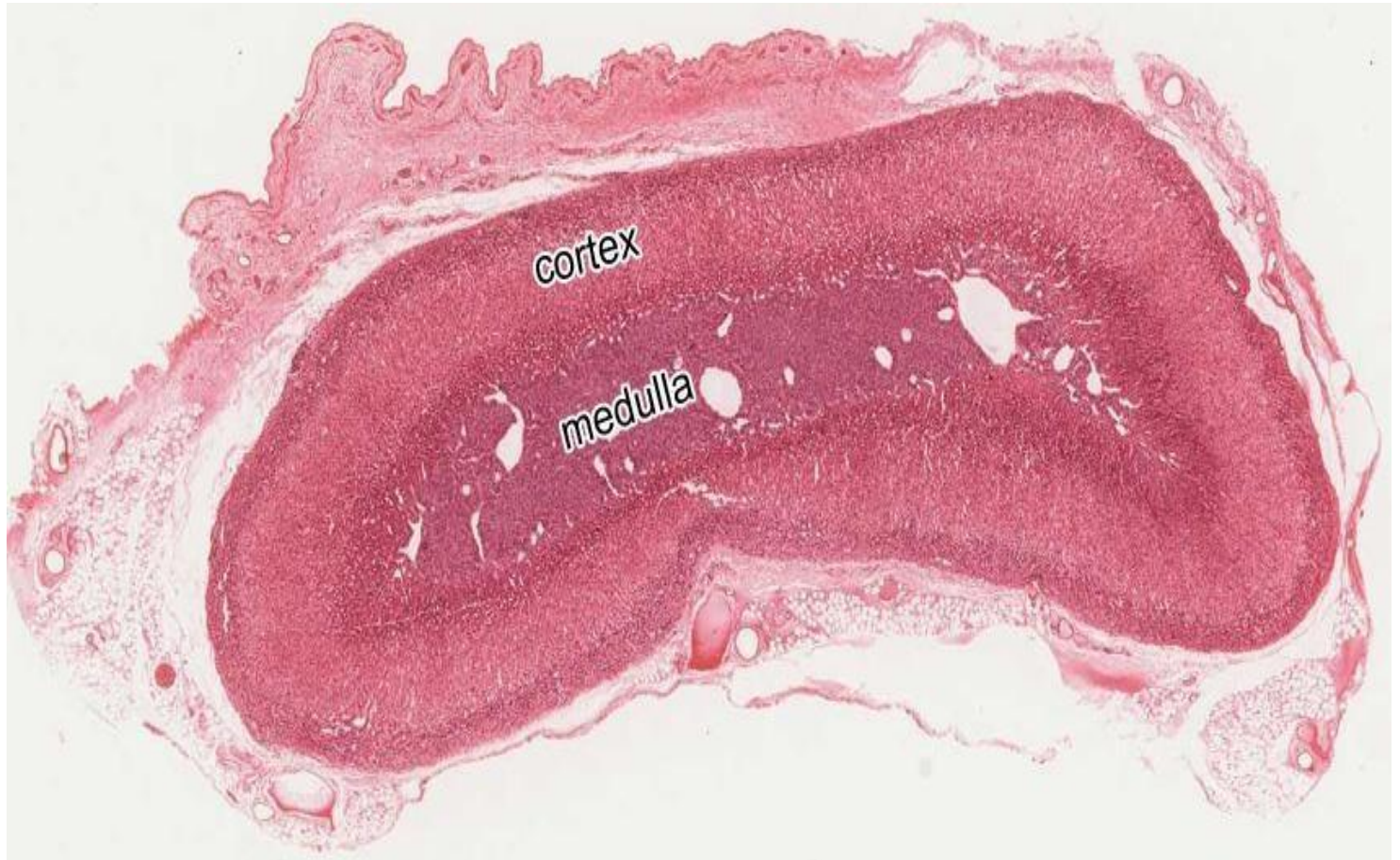
cortex → yellow in fresh state, contain cells full of fat droplets (precursor)

Medulla → Reddish-brown in fresh state, contain B.Vs

كيف اميز النخاع من القشرة وهو اصلاً ما في حد فاصل واضح بينهم؟

بالتخلاف لون: القشرة: لونها أصفر، والنخاع بني

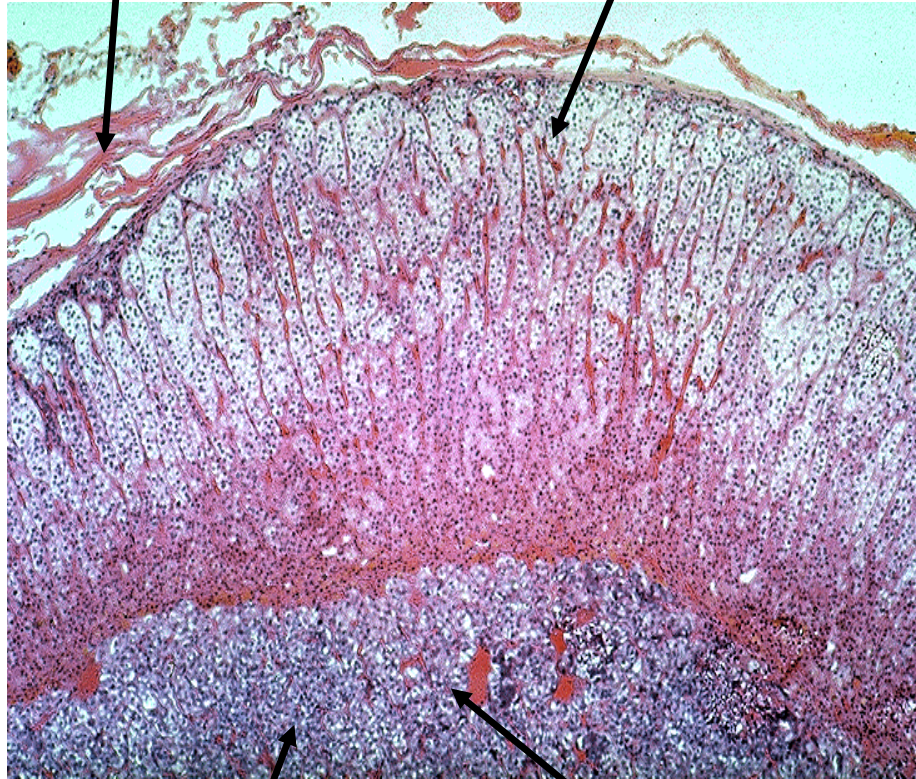
Suprarenal gland



Suprarenal gland

Acidophilic, vacuolated,
cortical, steroid producing cells

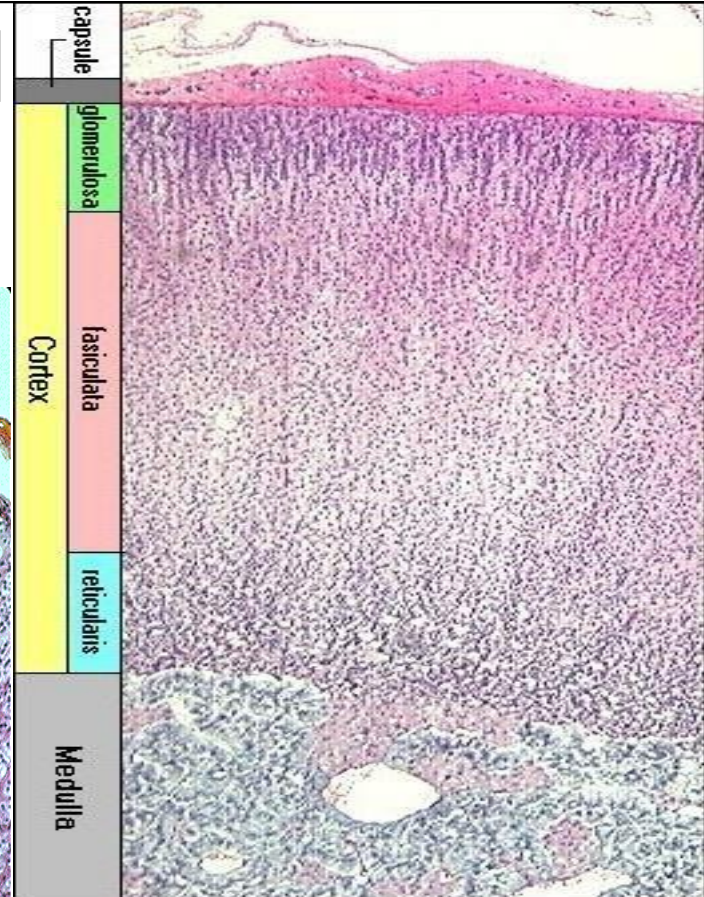
Capsule



Basophilic medullary cells

Large B.V

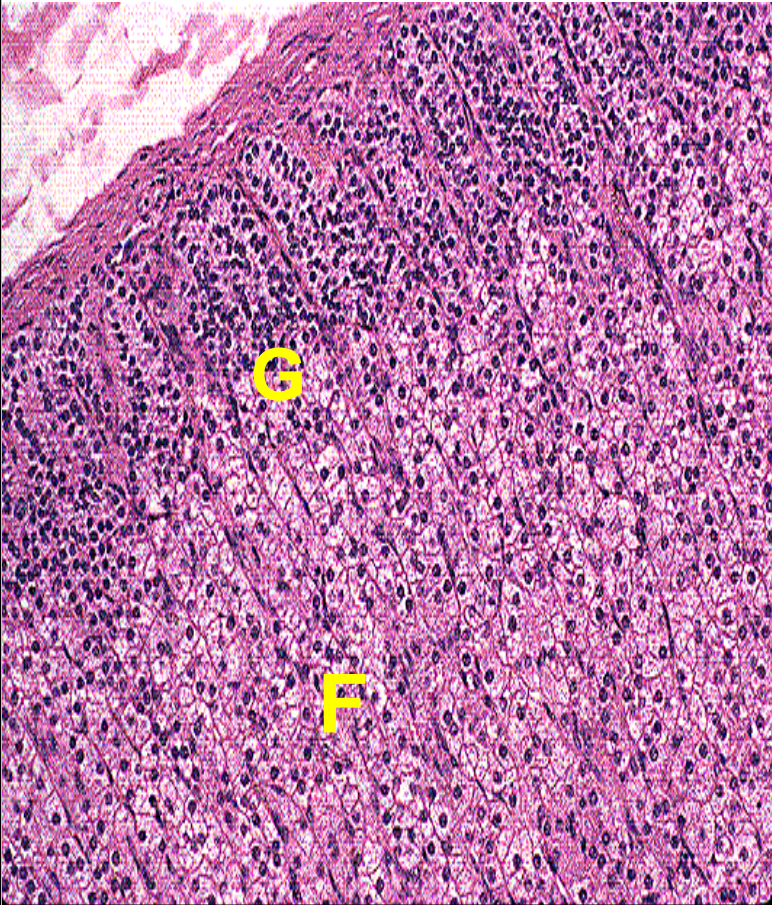
**medulla → highly vascularized



**اسباب تسمية الطبقات:

- 1) Z. glomerulosa → presence of arches
- 2) Z. fasciculata → highly vacuolated
- 3) Z. Reticularis → cells for irregular anastomosing cords (reticulum)

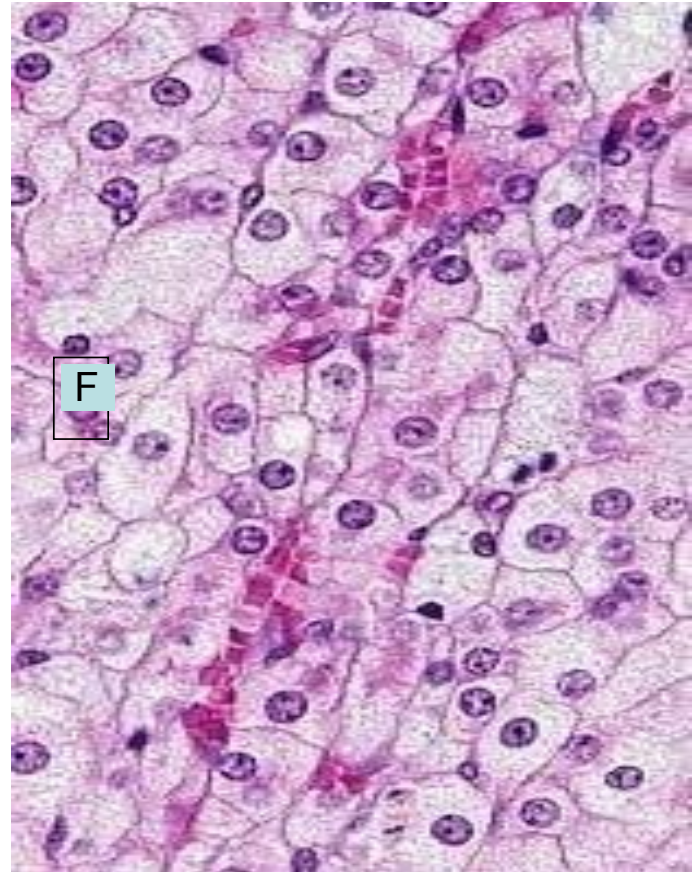
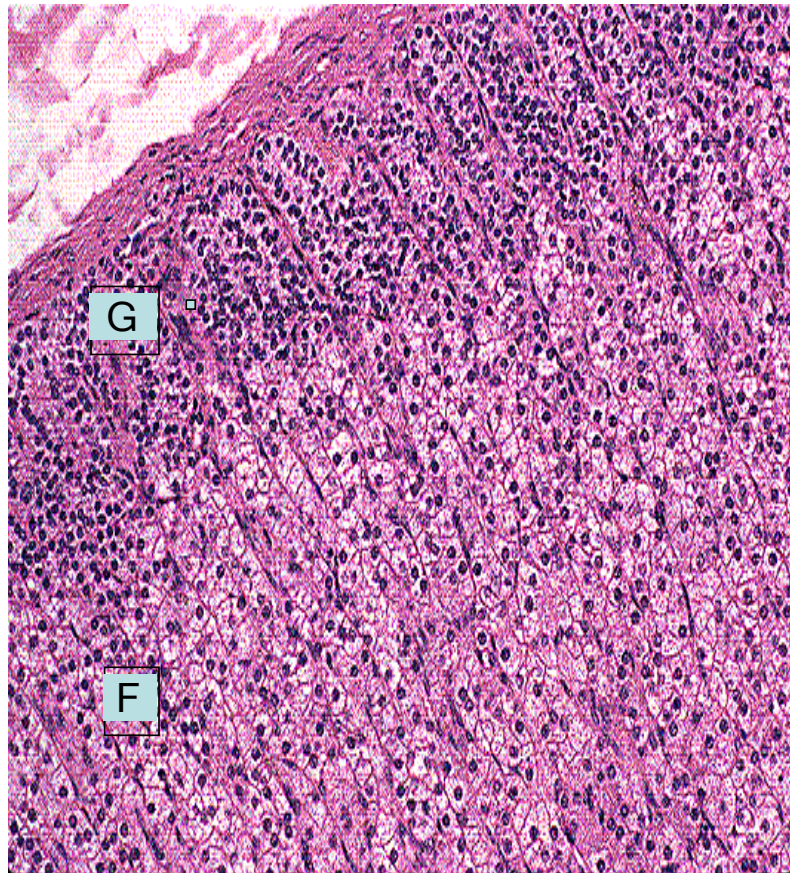
Suprarenal gland



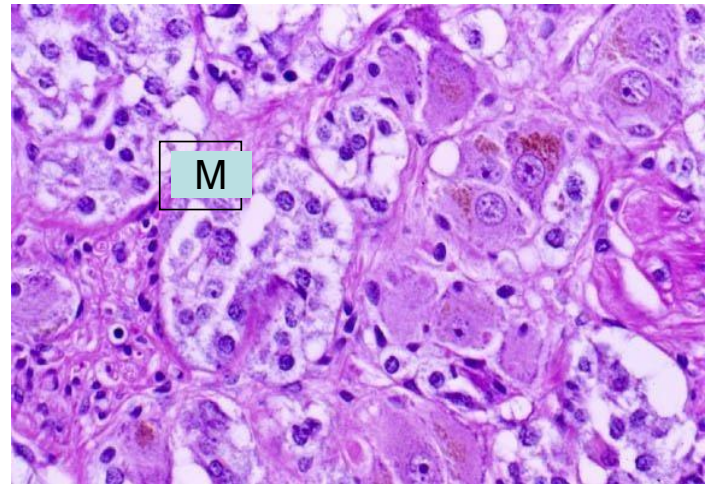
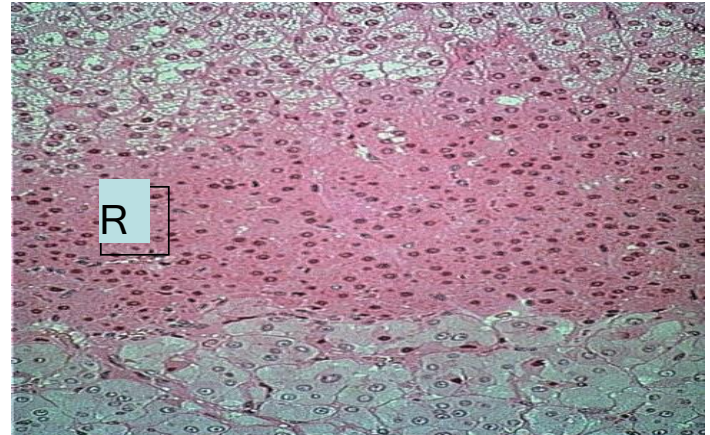
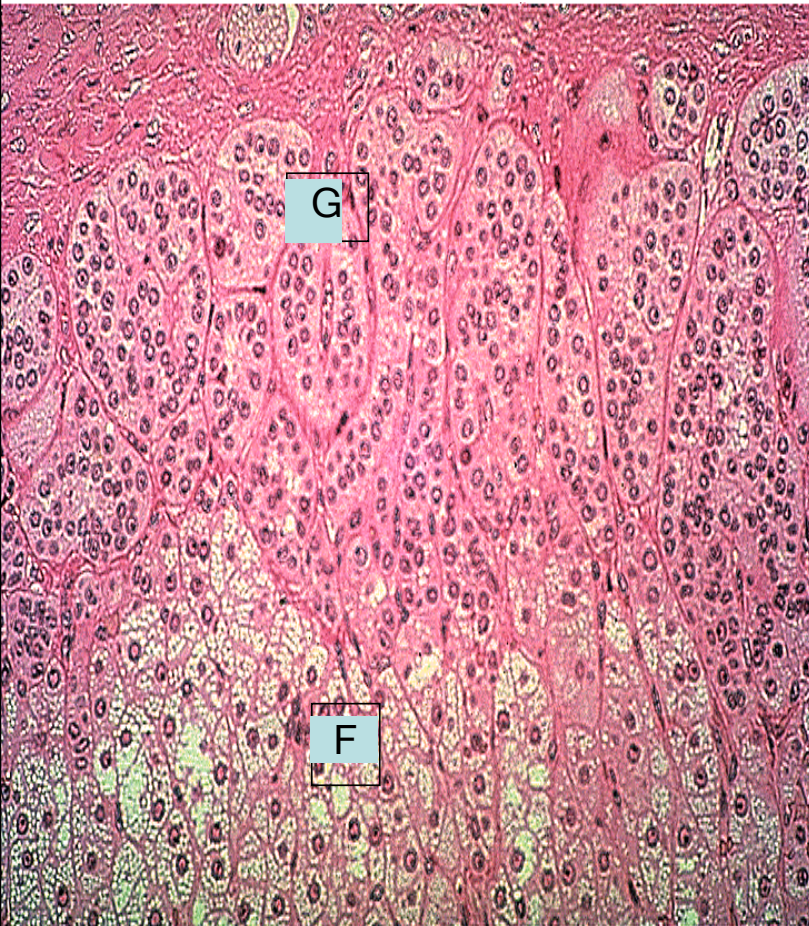
Zona glomerulosa → 15%, curved columns, produce aldosterone hormone.

Zona fasciculata → 65%, regular Cords, 1 or 2 cell thickness, separated by B.Vs, highly vacuolated with spongy appearance (lipid droplets) → spongiocytes, produce cortisone hormone

Suprarenal gland



Suprarenal gland



Zona Reticularis → 7%, irregular anastomosing cords, form a reticulum, produce androgen hormone

Medulla → basophilic cells arranged in groups, contain 1) protein secreting cells called chromaffin cells produce A+ NA, 2) Sympathetic ganglion cells, 3) Lymphocyte like cells

PANCREAS

Stroma:

Surrounded by **thin** capsule

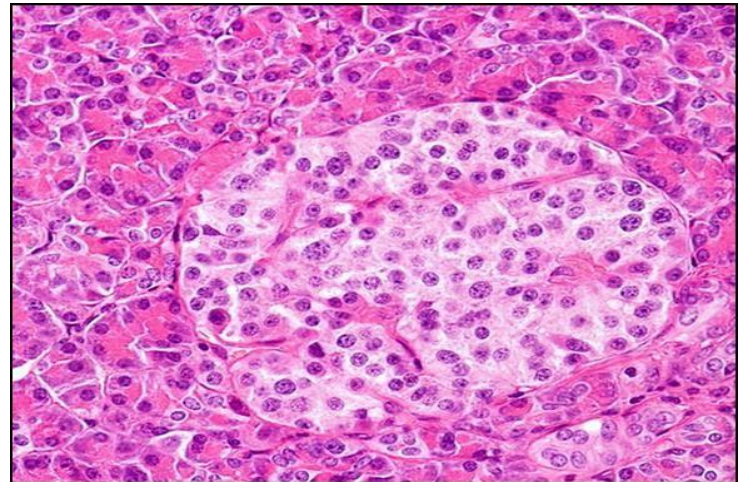
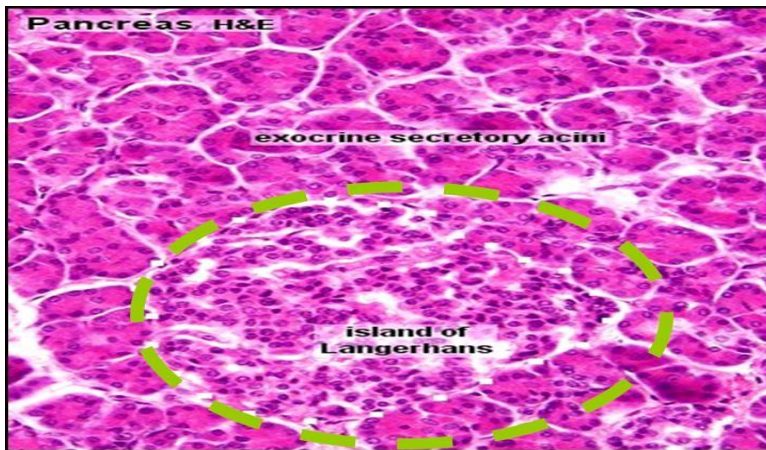
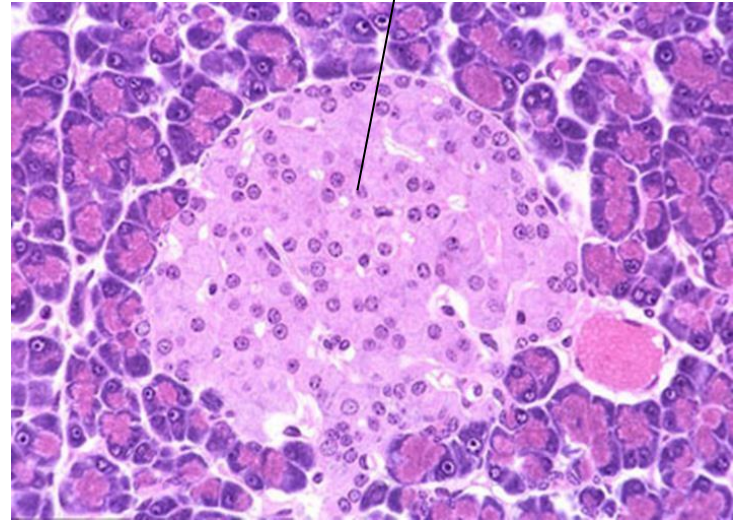
Parenchyma

cellular composition of the islands

- ❑ 70% beta-cells, insulin.
- ❑ 20% alpha-cells, glucagon.
- ❑ 5- 10 % delta-cells, somatostatin
- ❑ F- cells (PP)

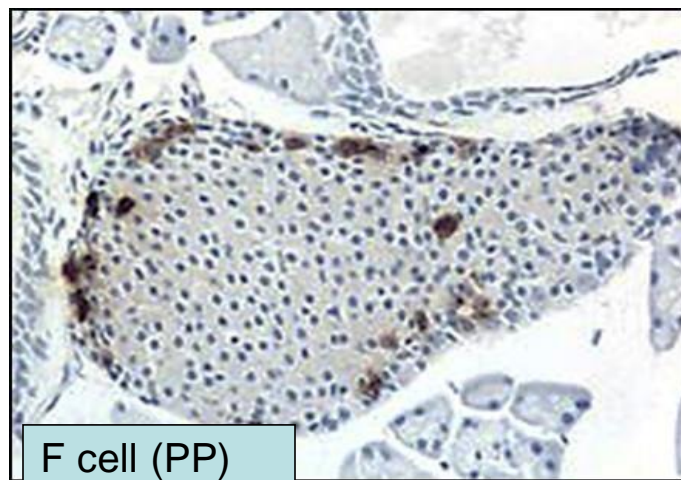
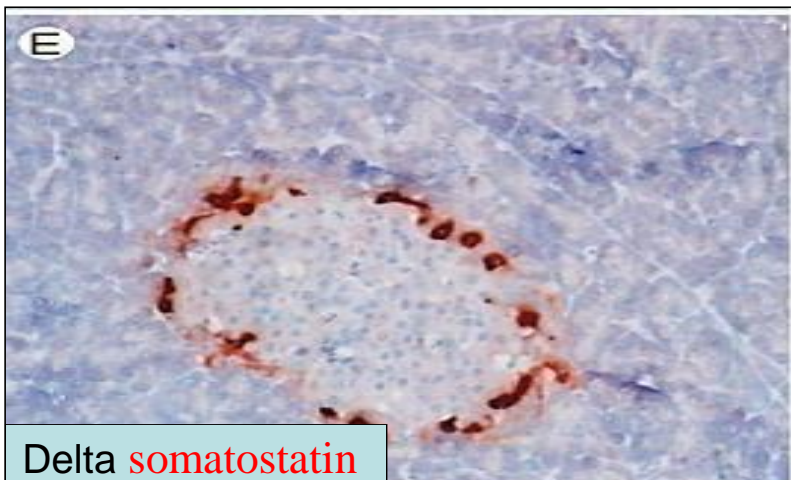
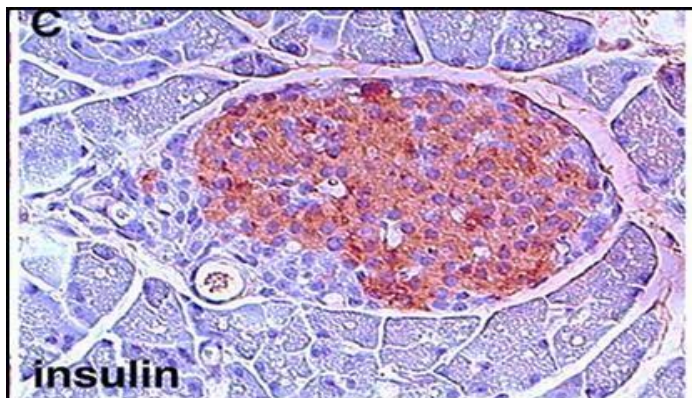
pancreatic polypeptides

islets of langerhan
pale in color

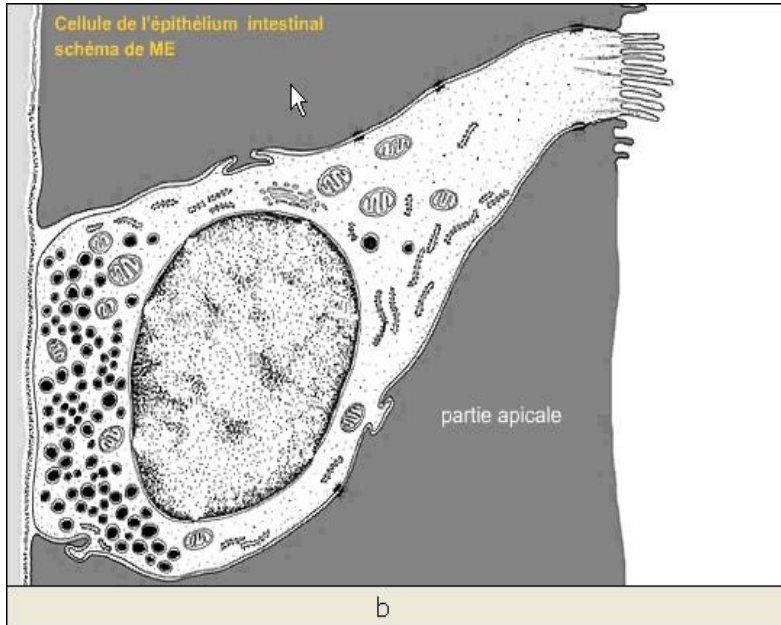


alpha cells are fewer in number than beta cells. in the periphery of island

beta cells in the center of the island

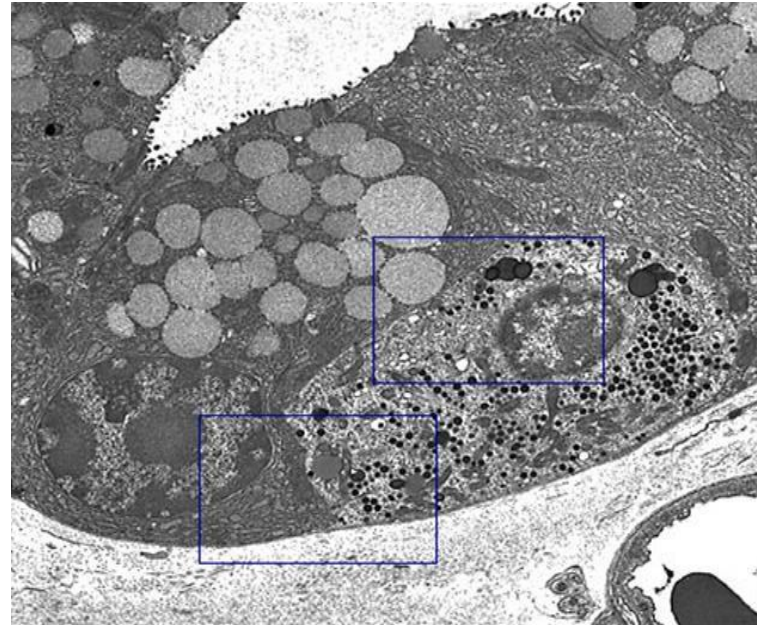


Microscopic features



Open type

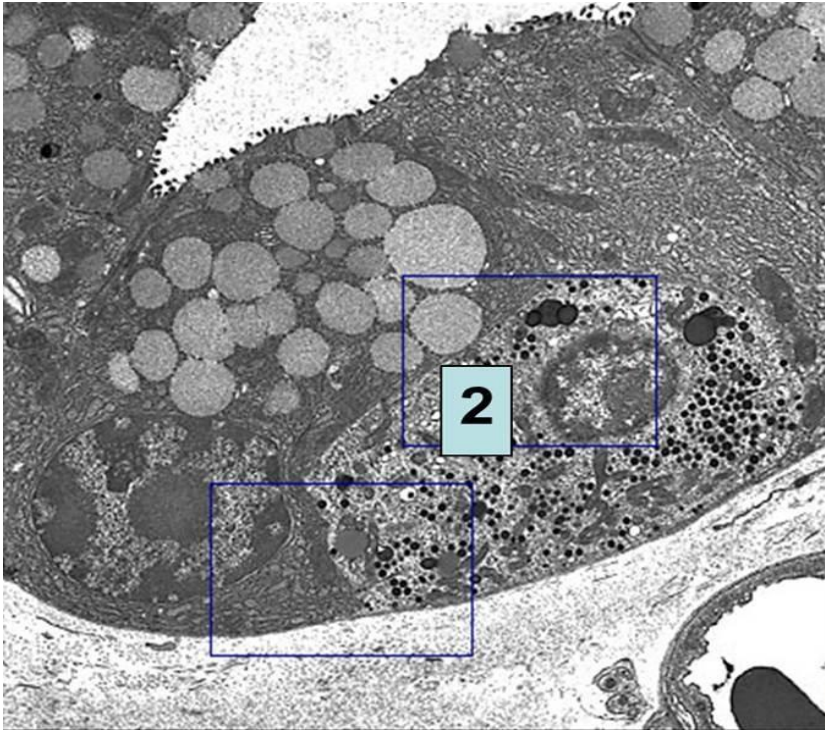
e.g. follicular cells
they have apical
surface that reaches
the lumen.



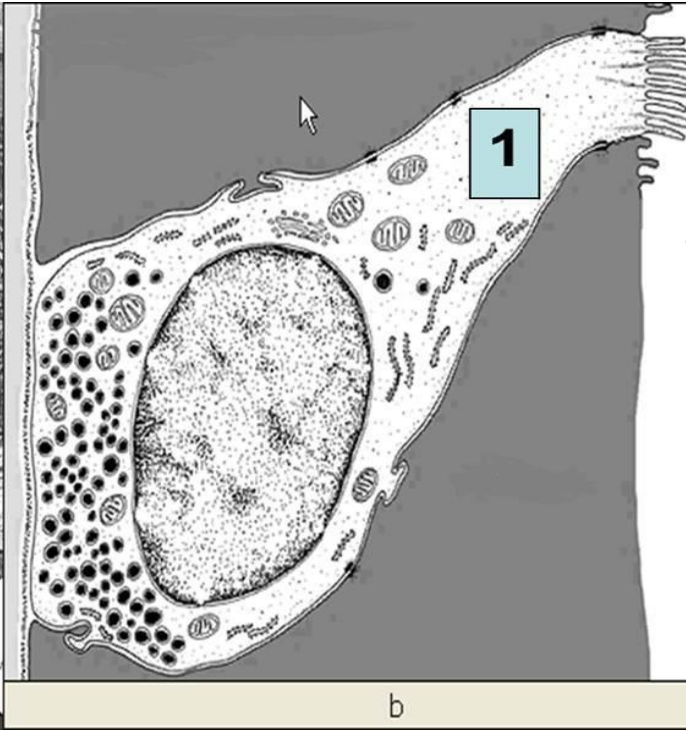
Closed type

e.g. C-cells
they do not reach
the lumen of gland

Closed type



Open type



Entero- endocrine cells

their granules
are basal

