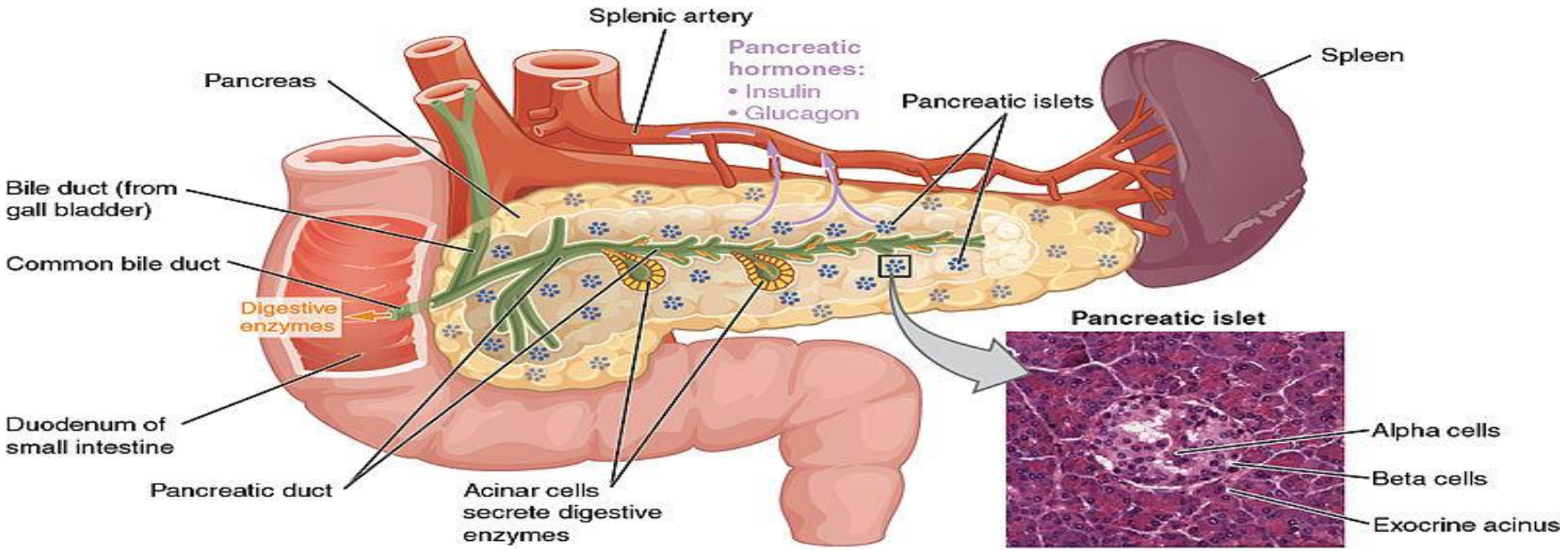
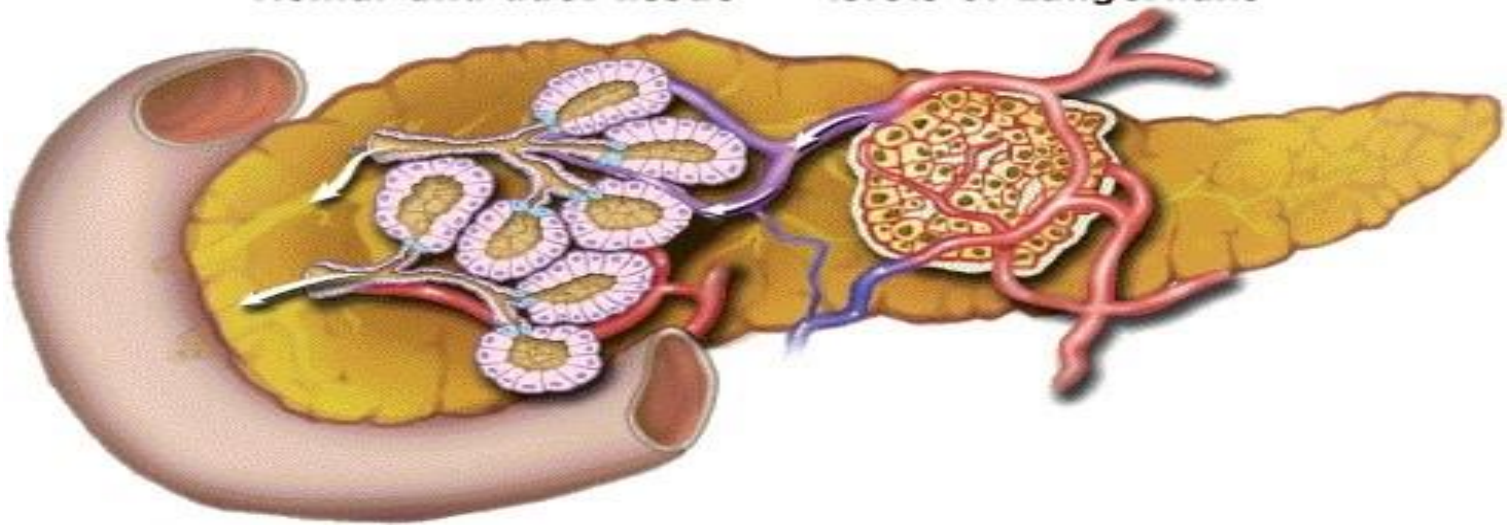
PANCREAS



Exocrine
Acinar and duct tissue

Endocrine
Islets of Langerhans



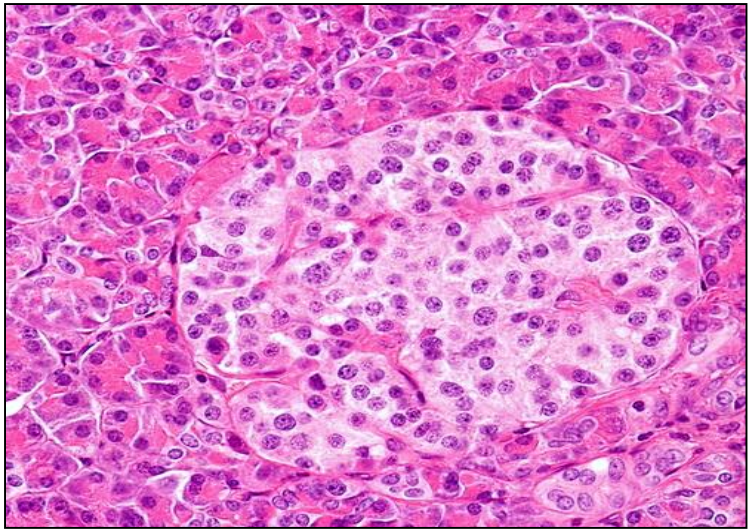
PANCREAS

- Exocrine and endocrine gland.
- The exocrine part produces pancreatic juice.
- The endocrine part, ~1% , consists of the cells of the **islands of Langerhans**.

Endocrine part: Islets of Langerhans

Masses of pale staining cells scattered between the pancreatic acini

- They are more in the **tail** than head of pancreas
- The cells are separated by fenestrated capillaries (highly vascularized)
- Cells of islets of Langerhans are Alpha, Beta, Delta, F (PP) cells



- **Structure :** of the **islands of Langerhans**.

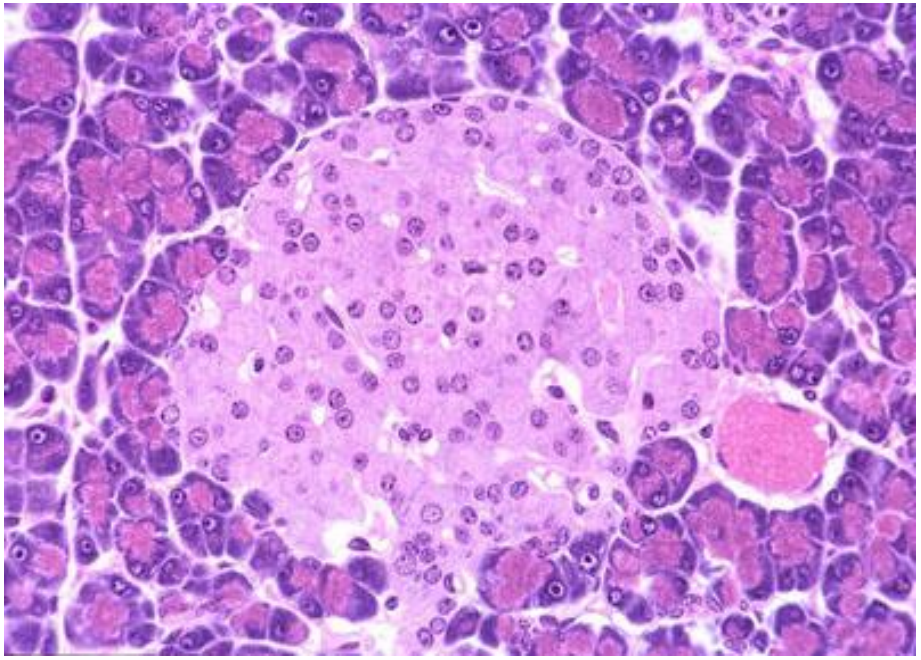
Stroma:

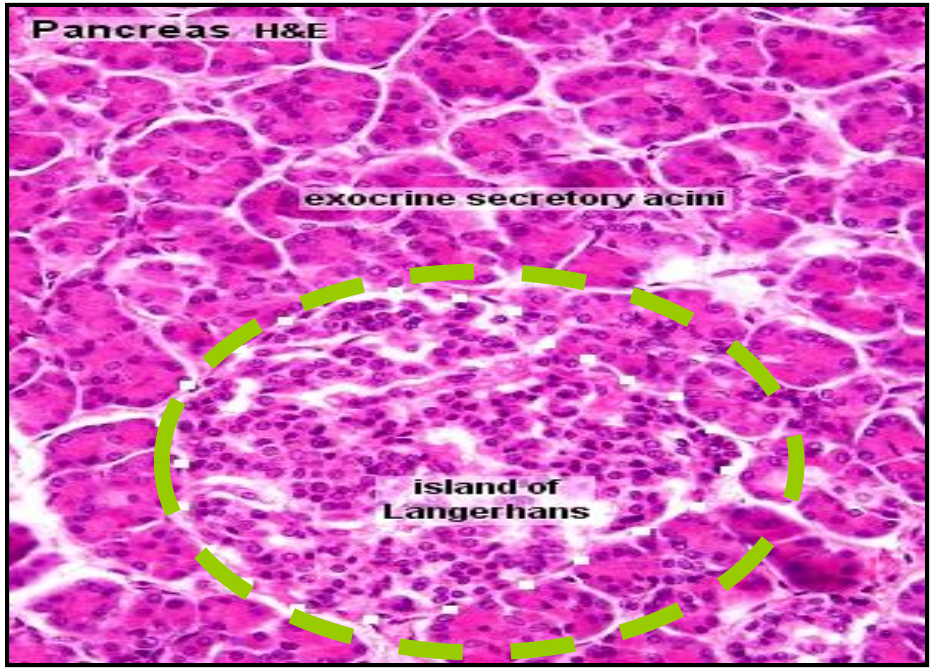
Surrounded by **thin** capsule

Parenchyma

cellular composition of the islands

- **70% beta-cells**, **insulin**. Insulin stimulates
- **20% alpha-cells**, **glucagon**.
- **5- 10 % delta-cells** which secrete **somatostatin**,
- **F- cells (PP)**





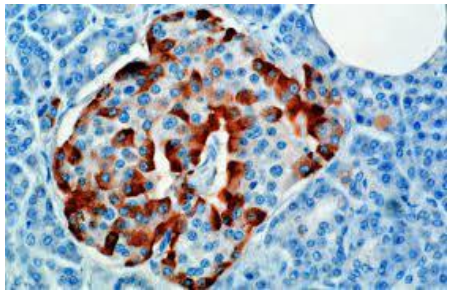
Beta (B) cells (70%):

- Produce **insulin** which **lower** blood sugar
- Cells are small in size, most numerous cell type, central in location in islets

Alpha (A) cells (20%):

- Produce **glucagon** which **increase** blood sugar
- Cells larger in size, fewer in number, peripheral location in Islets
- Stain **pink**

Beta cells

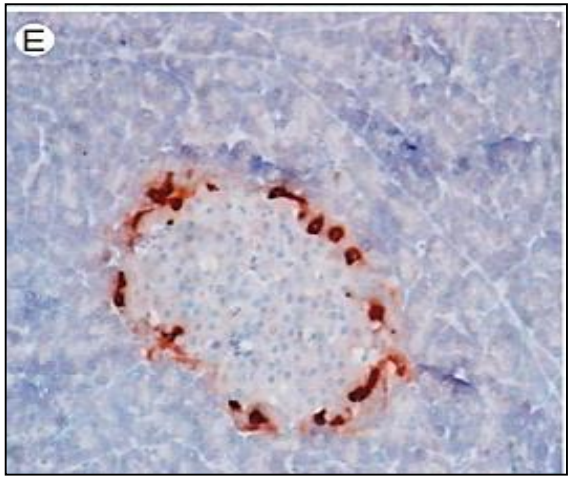


Alpha cells

Delta cells:

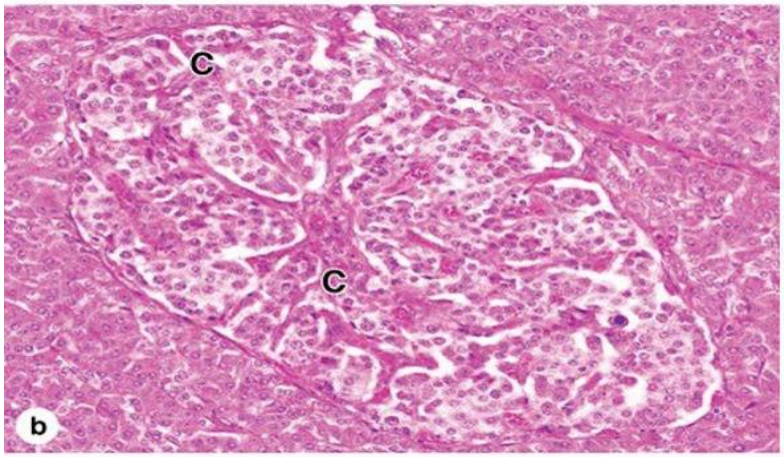
- Secret somatostatin (growth inhibiting factor)
- Cells scattered at periphery and less abundant

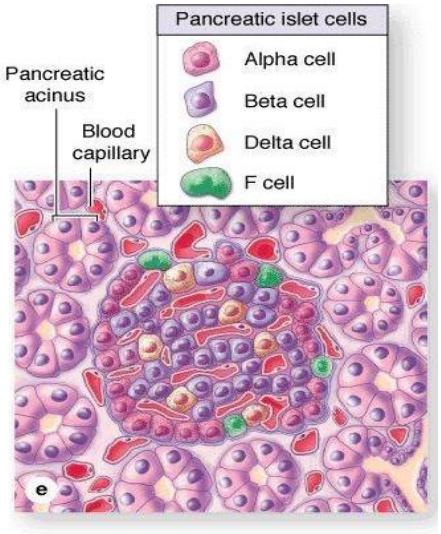
Delta cells

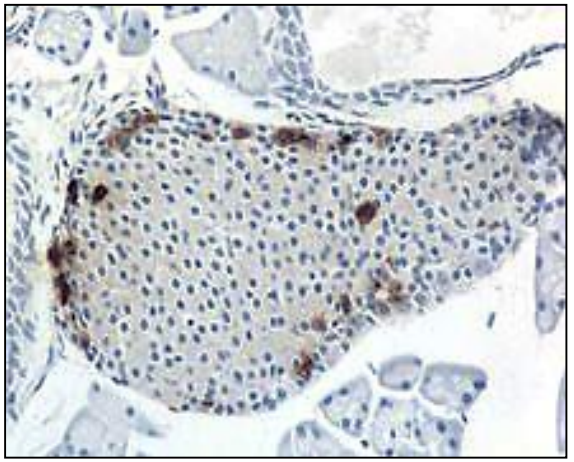


F (PP) cells:

- Very few
- Secrete pancreatic polypeptide h.
- Regulate exocrine pancreas secretions

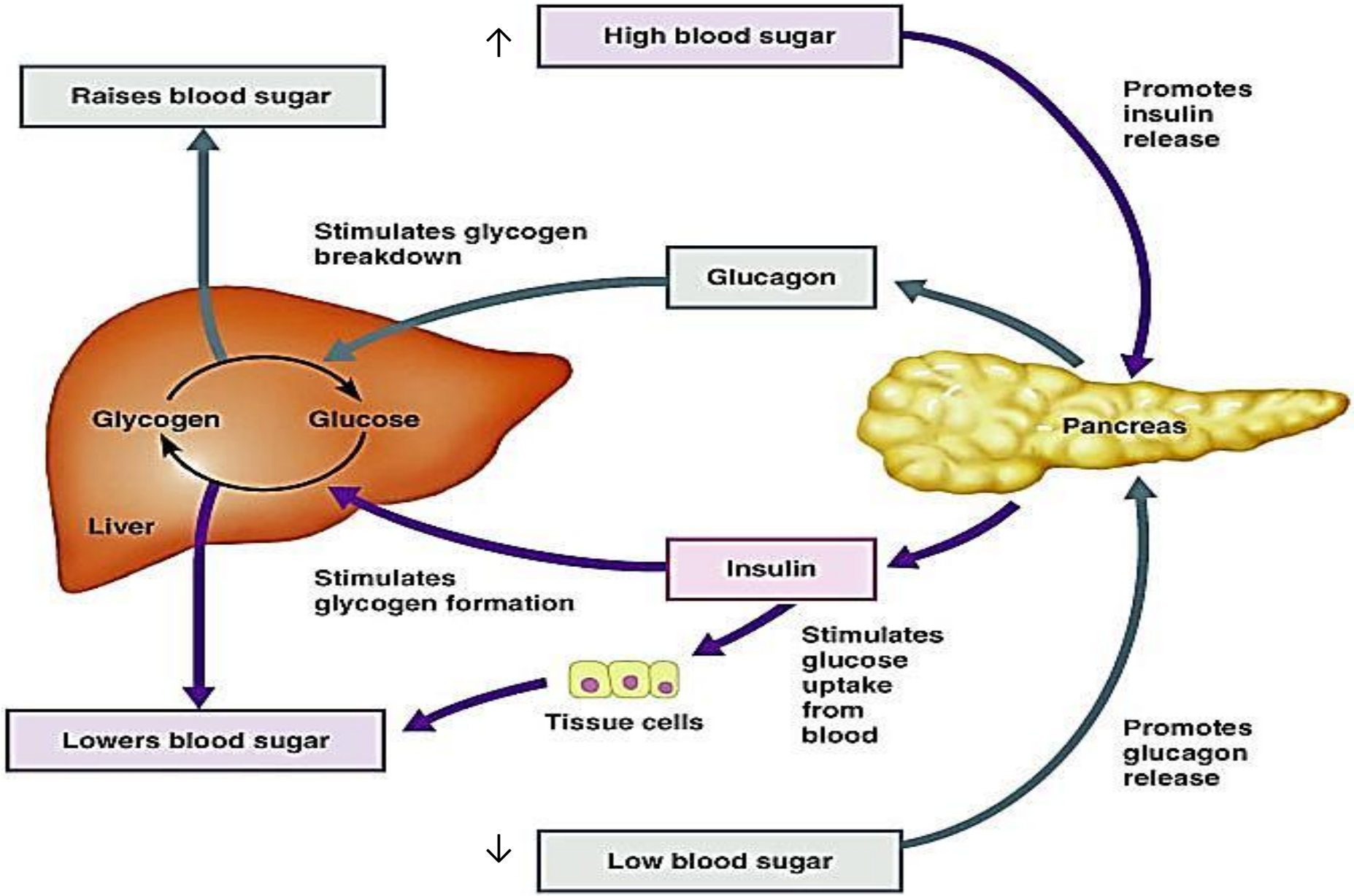




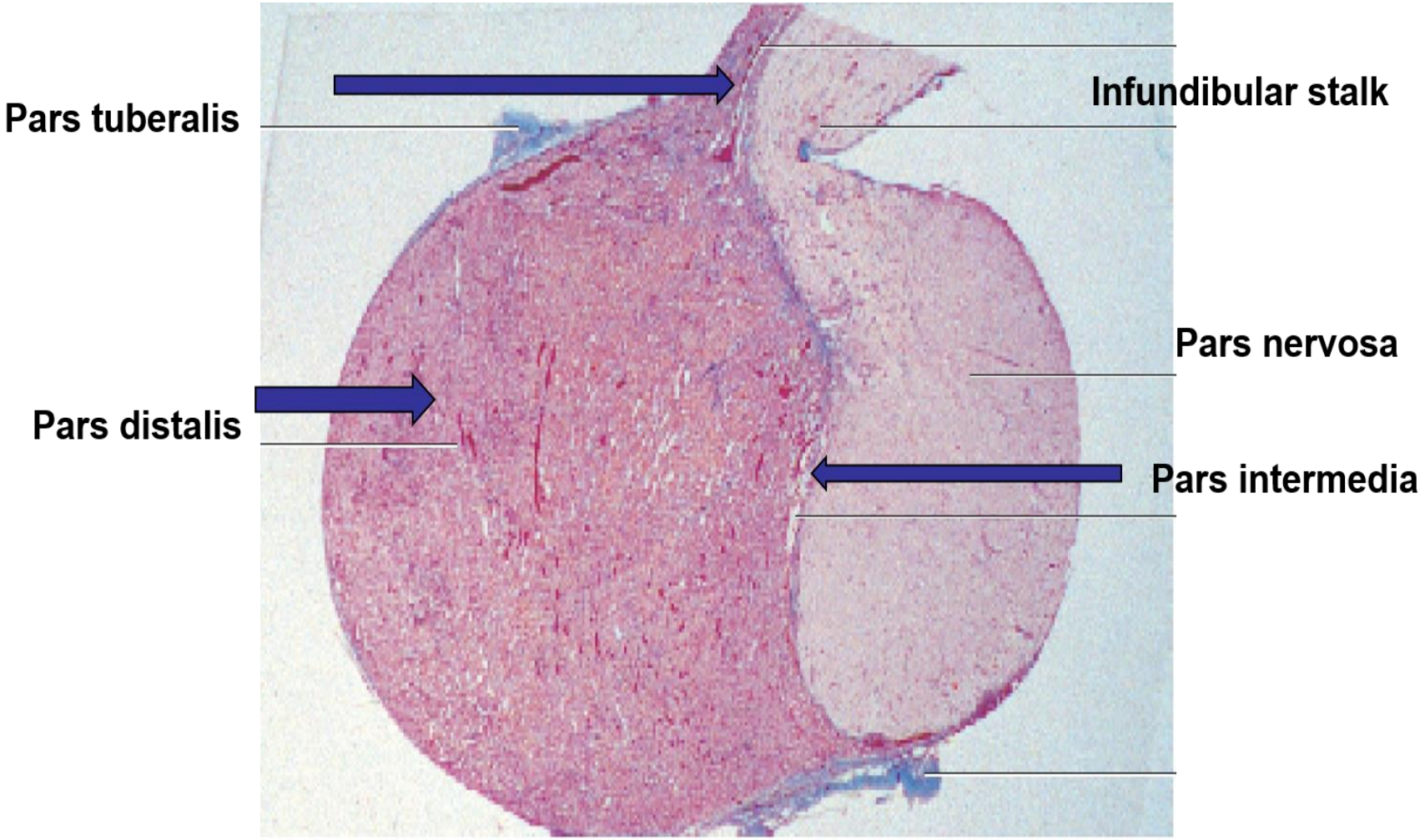


PP cells

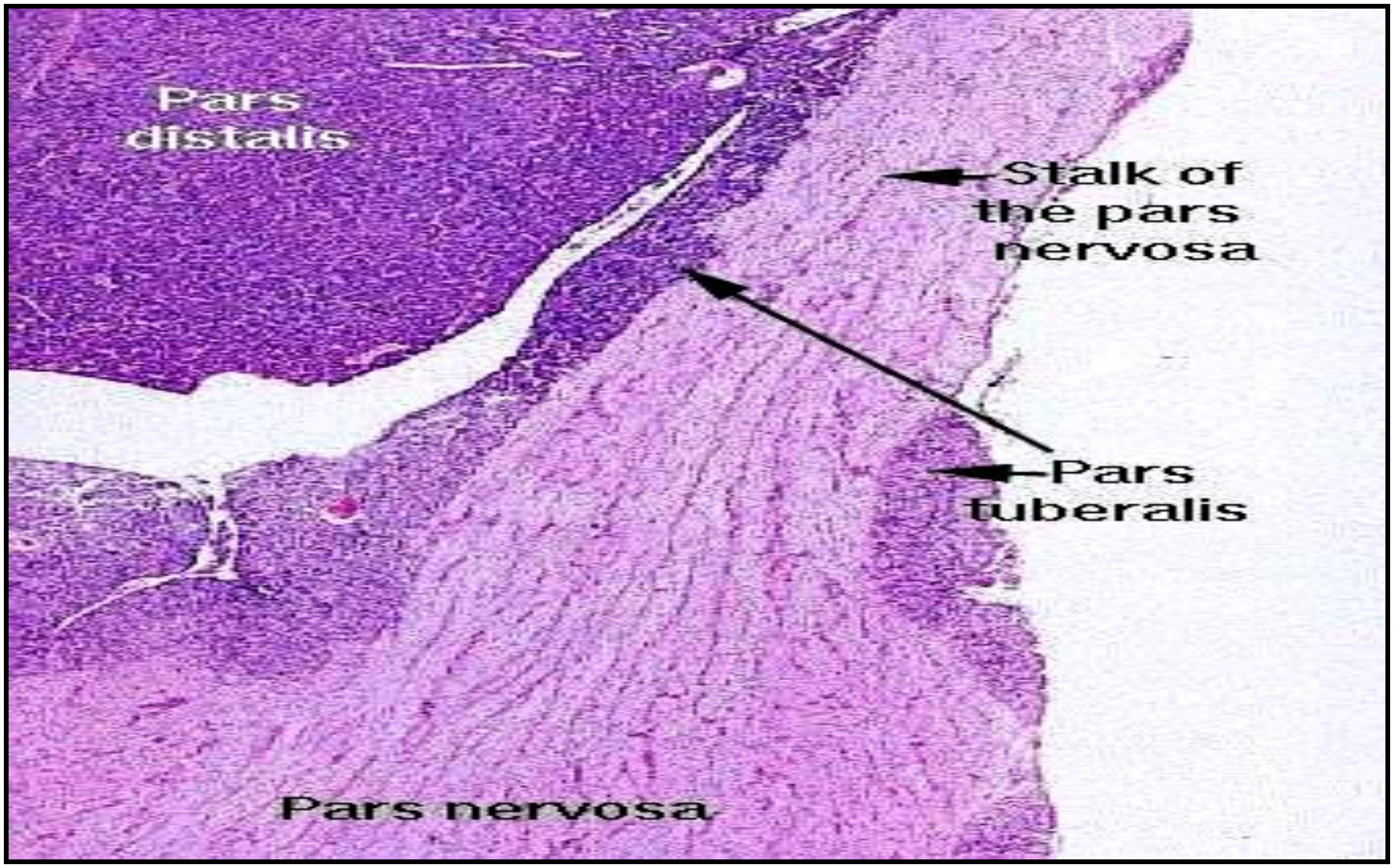
Regulation of blood glucose level



PITUITARY GLAND

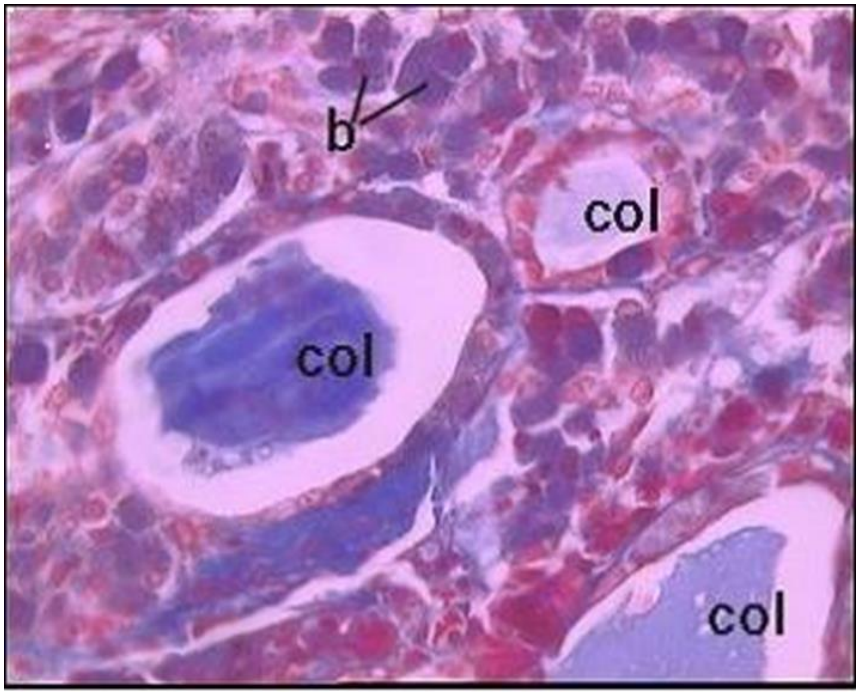


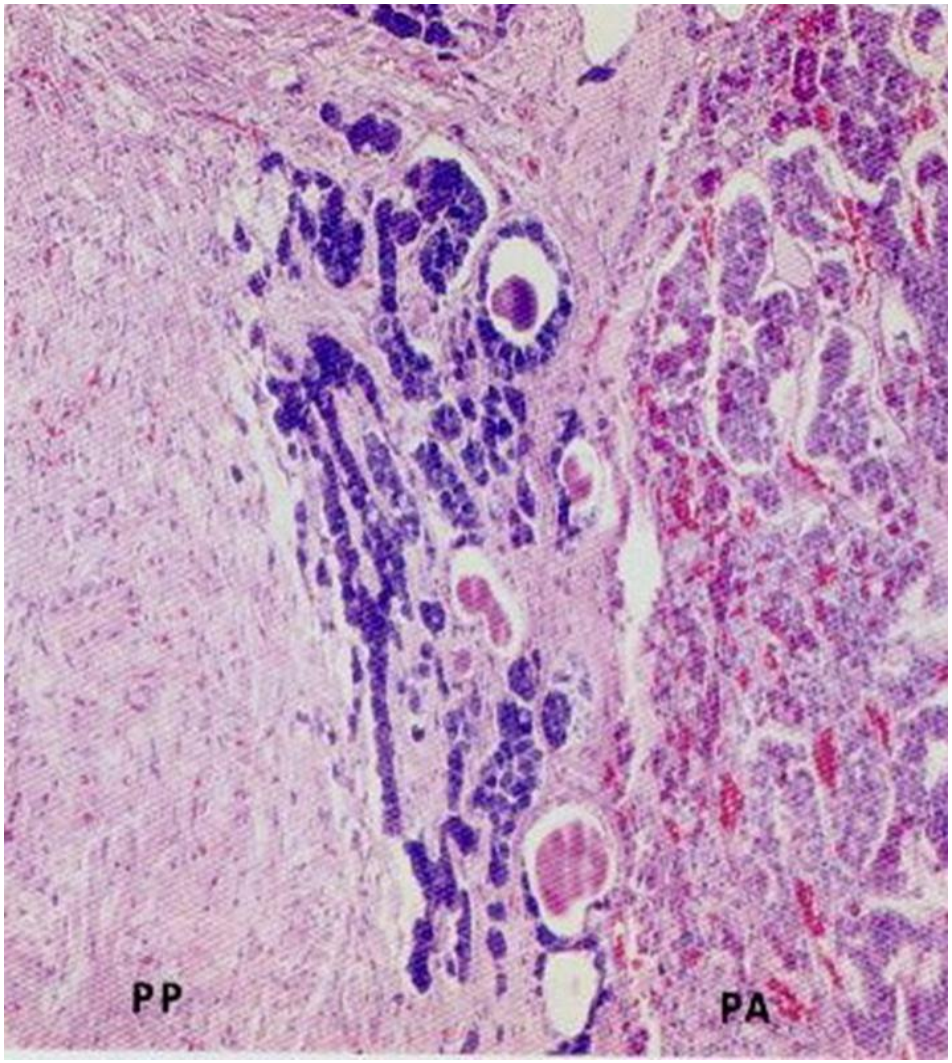
PITUITARY GLAND



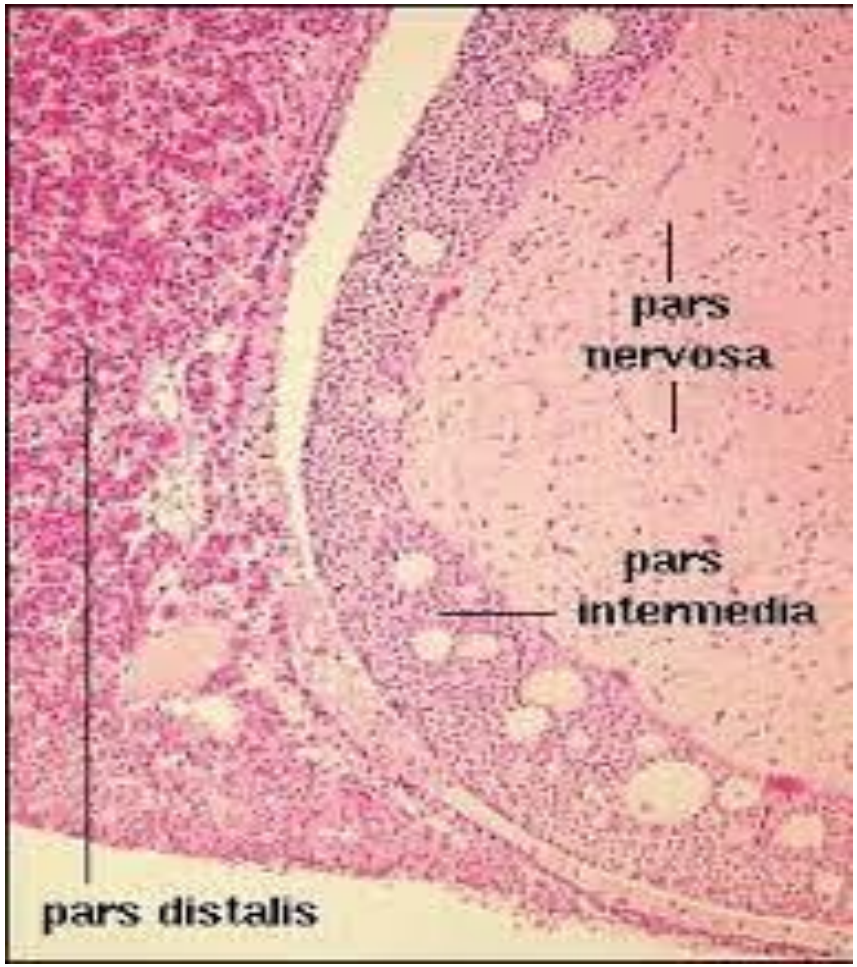
Pars Intermedia

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





Pars Intermedia



Pars distalis

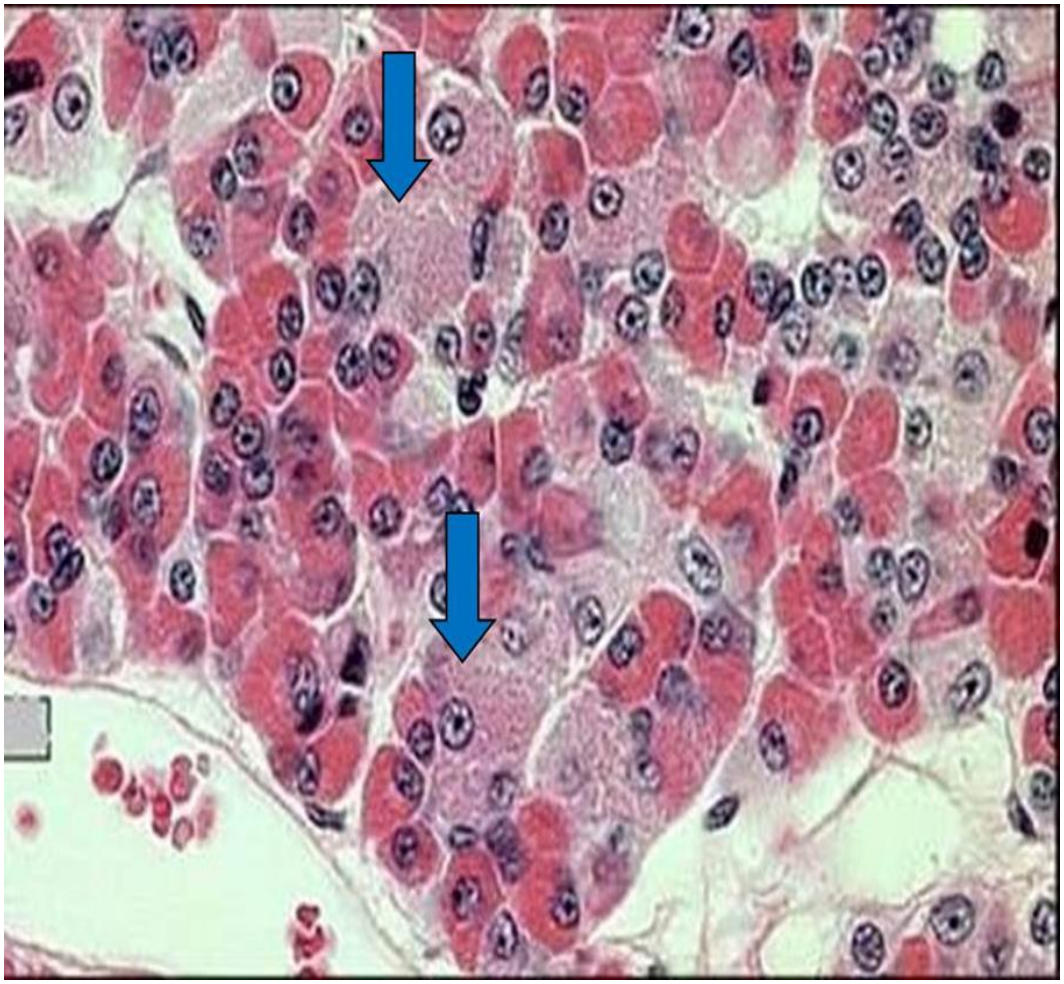
- Chromophils

1- Acidophils 37%

2- Basophils 11%

- Chromophobes 52%

- Fenestrated sinusoids

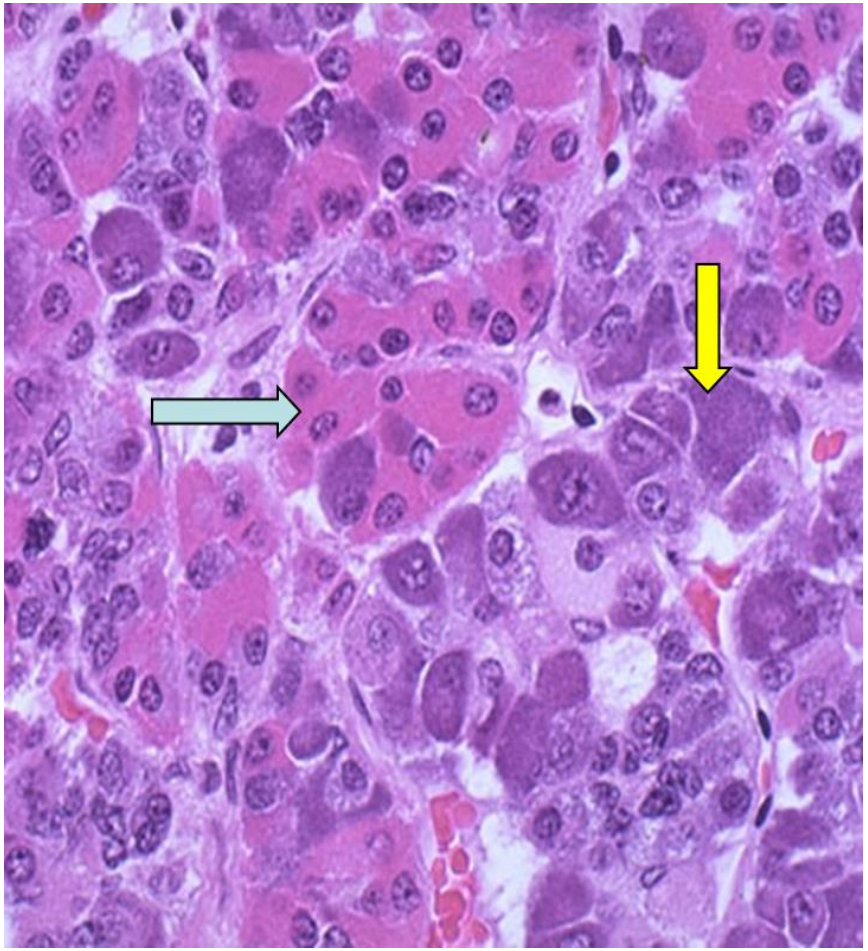


❑ Acidophils

- **Somatotrophs**
- Growth H.
- **Mammotrophs**
- Prolactin

- Small in ♂and non pregnant ♀
- Large irregular in pregnant and lactating ♀
- **Crinophagy:**

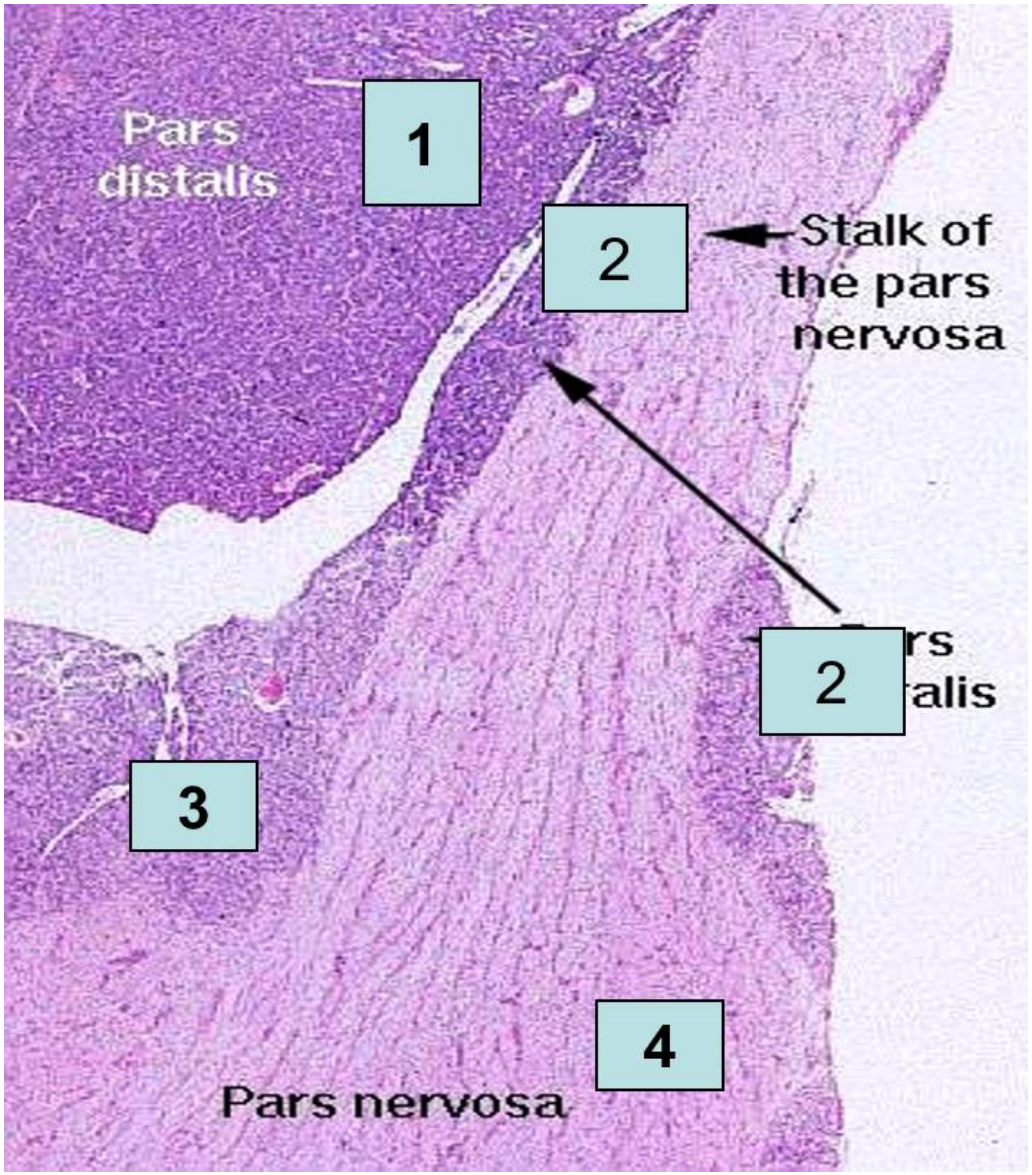
when suckling is terminated, lysosomes eliminate the excess secretory granules



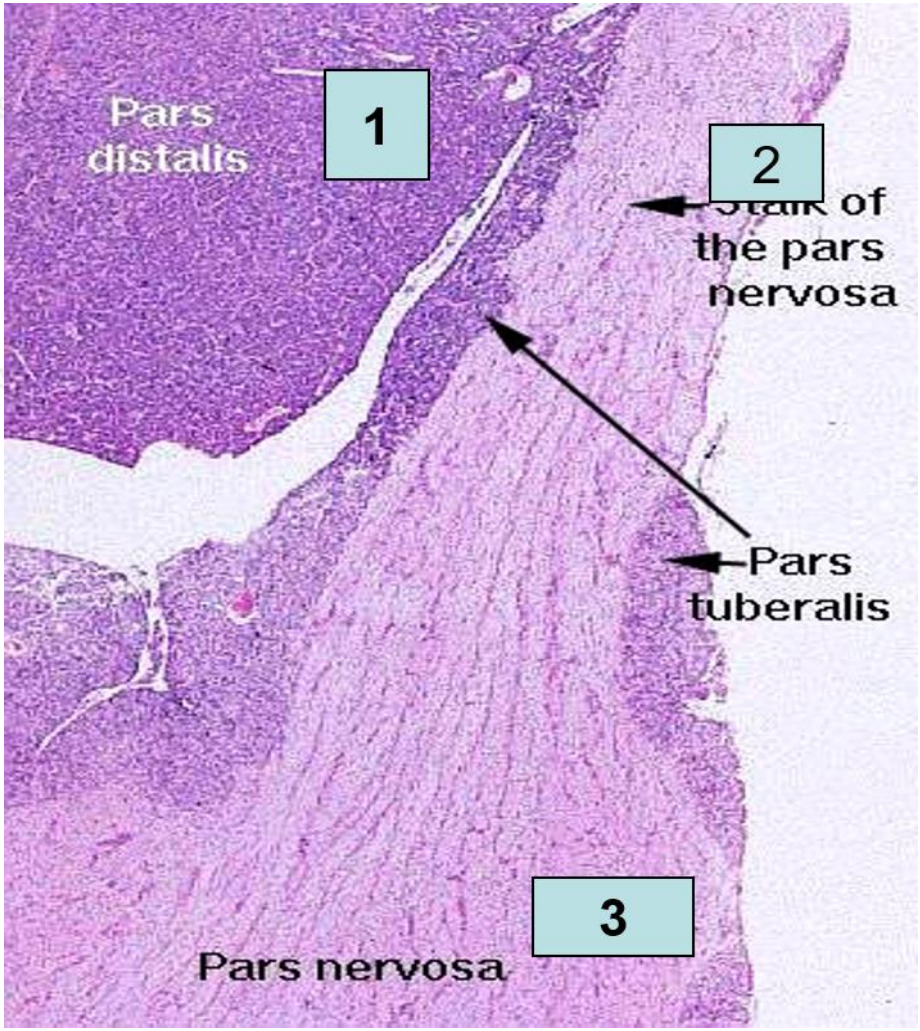
❑ Basophils :

- **TSH**
- **FSH,LH**
- **ACTH**

1. Pars distalis
2. Pars tubularis
3. Pars intermedia
4. Pars nervos

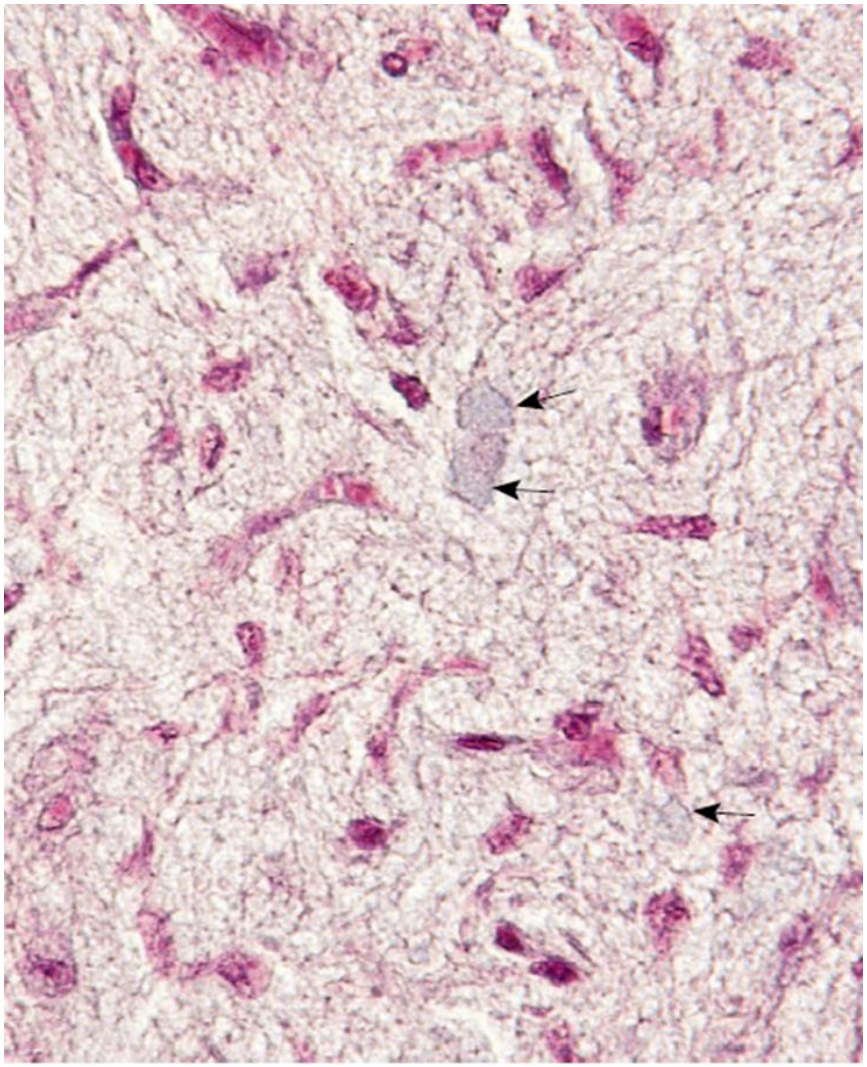


Neurohypophysis



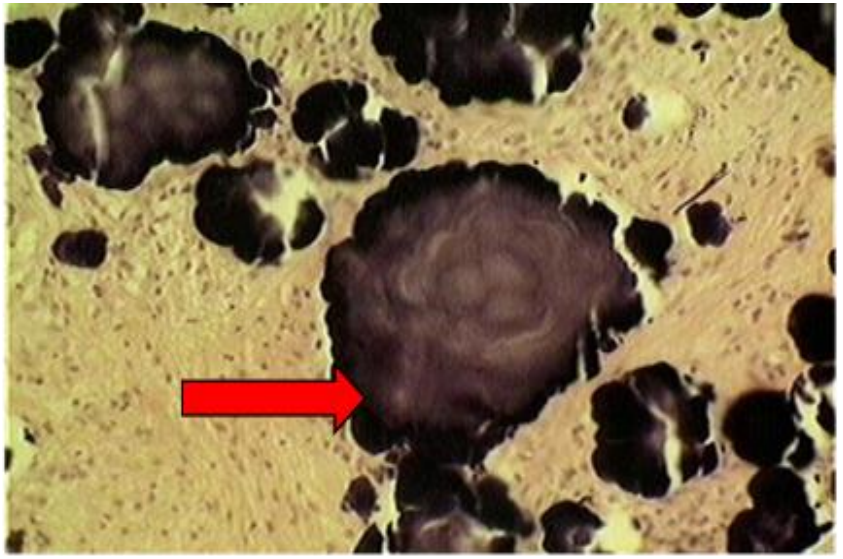
Neurohypophysis

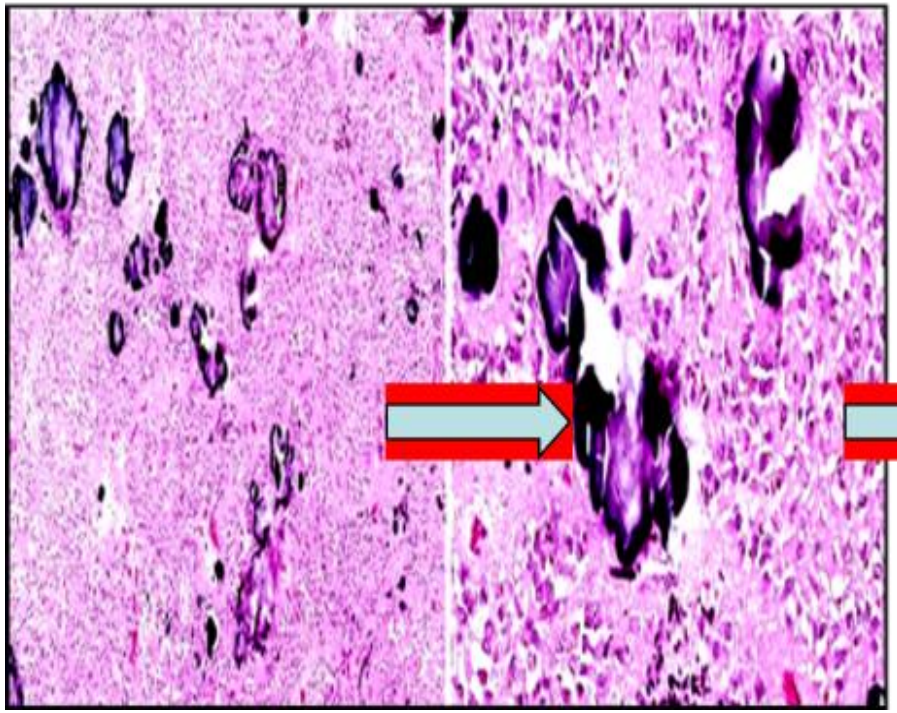
1. Unmyelinated axons
2. Herring bodies (ADH, Oxytocin)
3. Pituicytes.
4. Rich blood capillary plexus

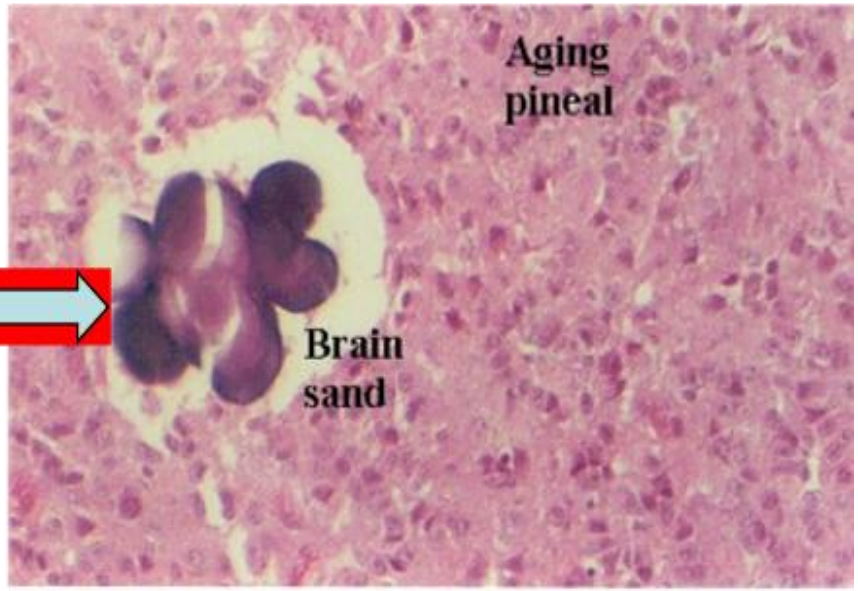


Pineal gland (Epiphysis cerebri)

1- pinealocytes
2- Astrocytes
3- Blood vessel
- **Brain sand with old age**

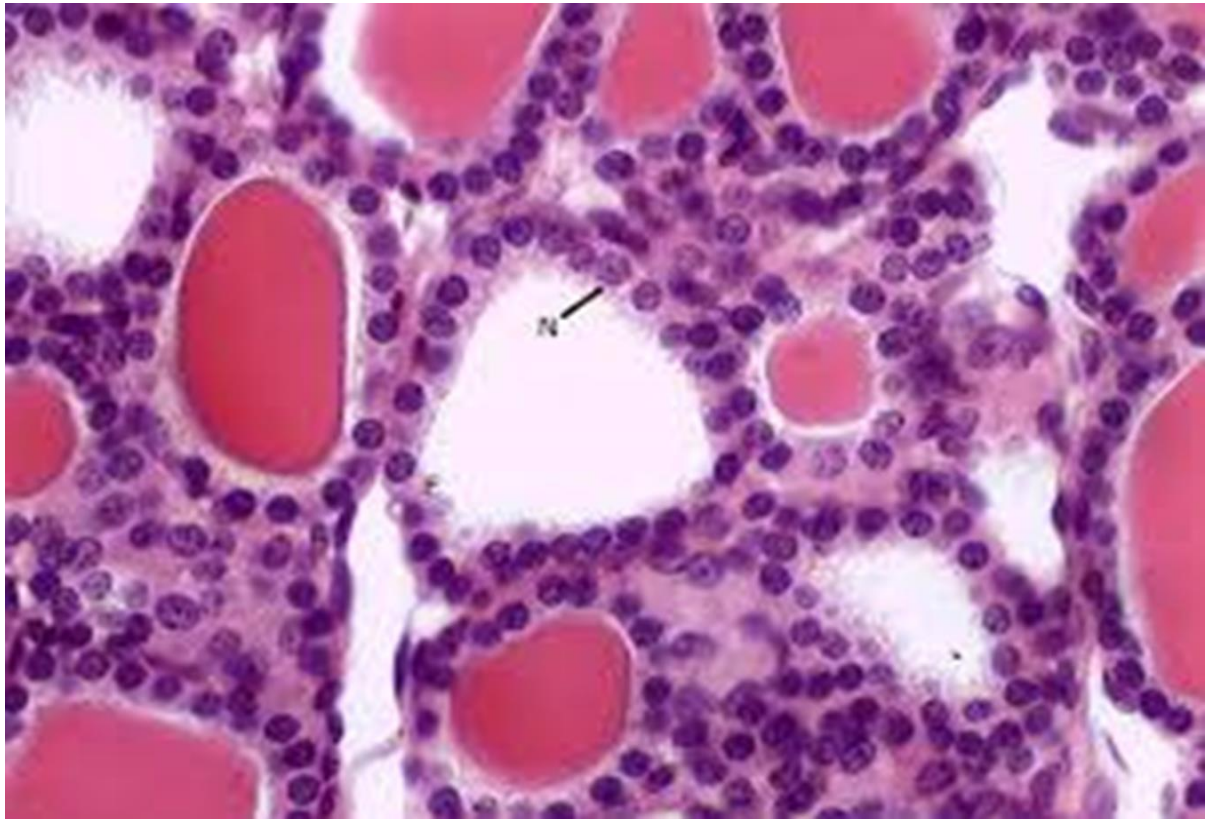






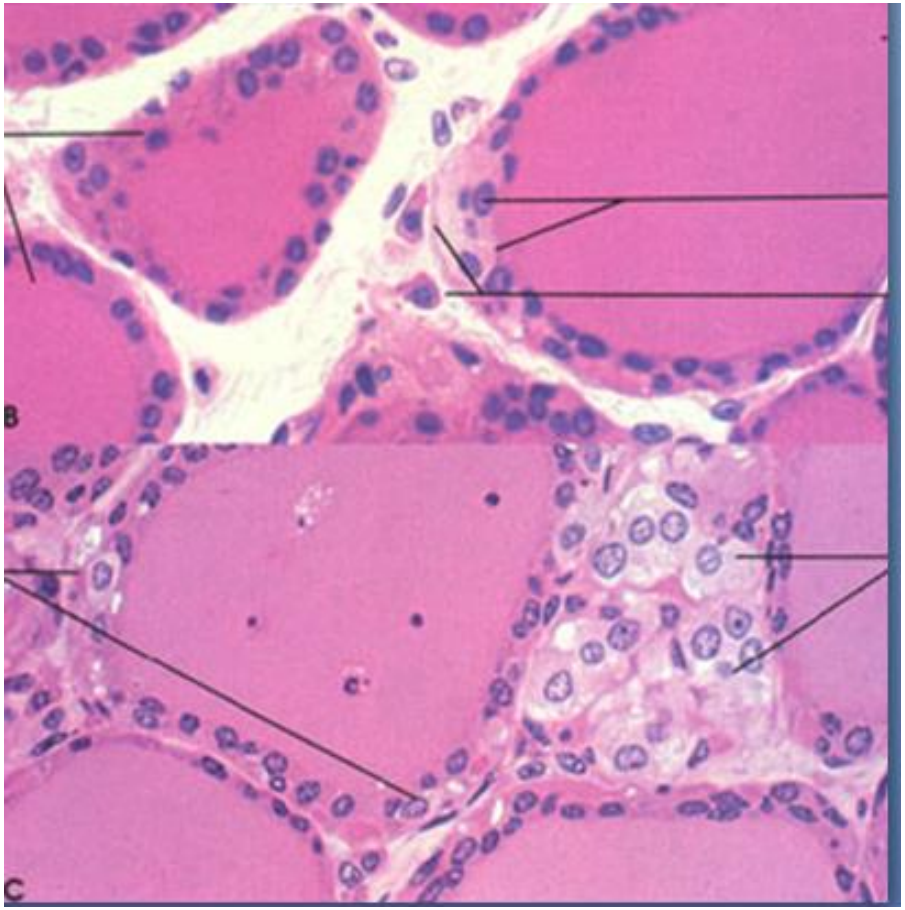
Thyroid

- 1.Follicular cells
  2. Parafollicular (clear) cells
  3. Interfollicular cell

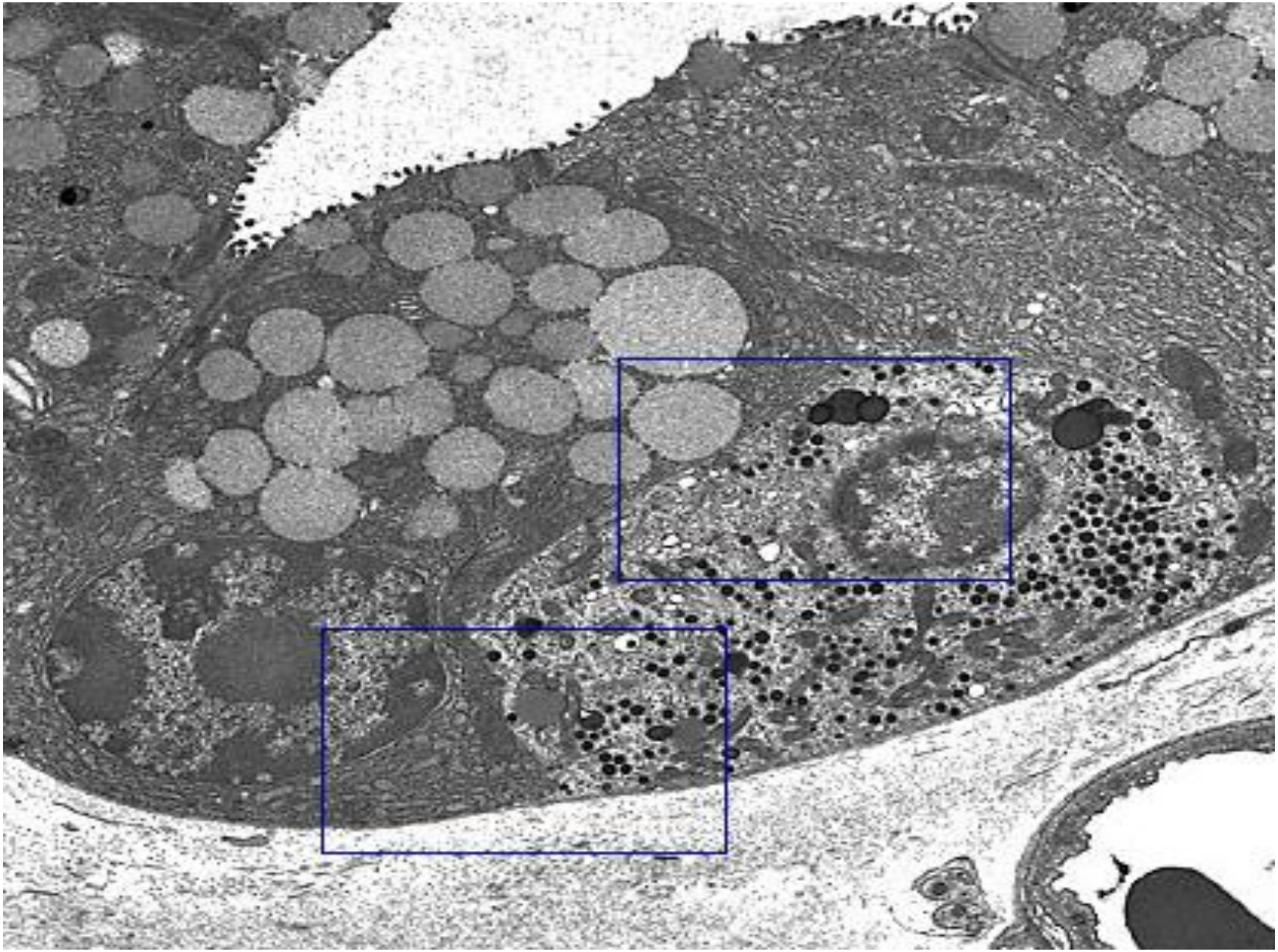


Thyroid

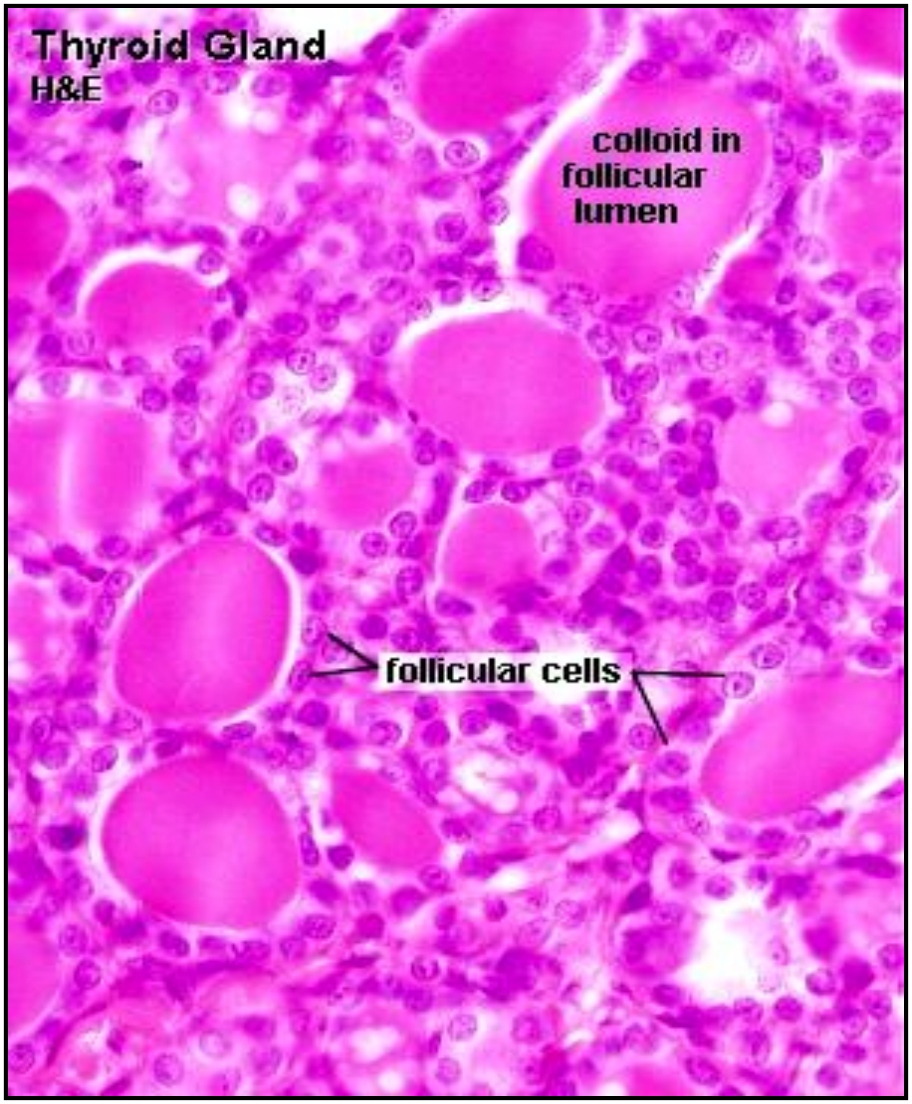
1. Follicular cells
2. **Interfollicular cells**
3. Parafollicular (clear) cells

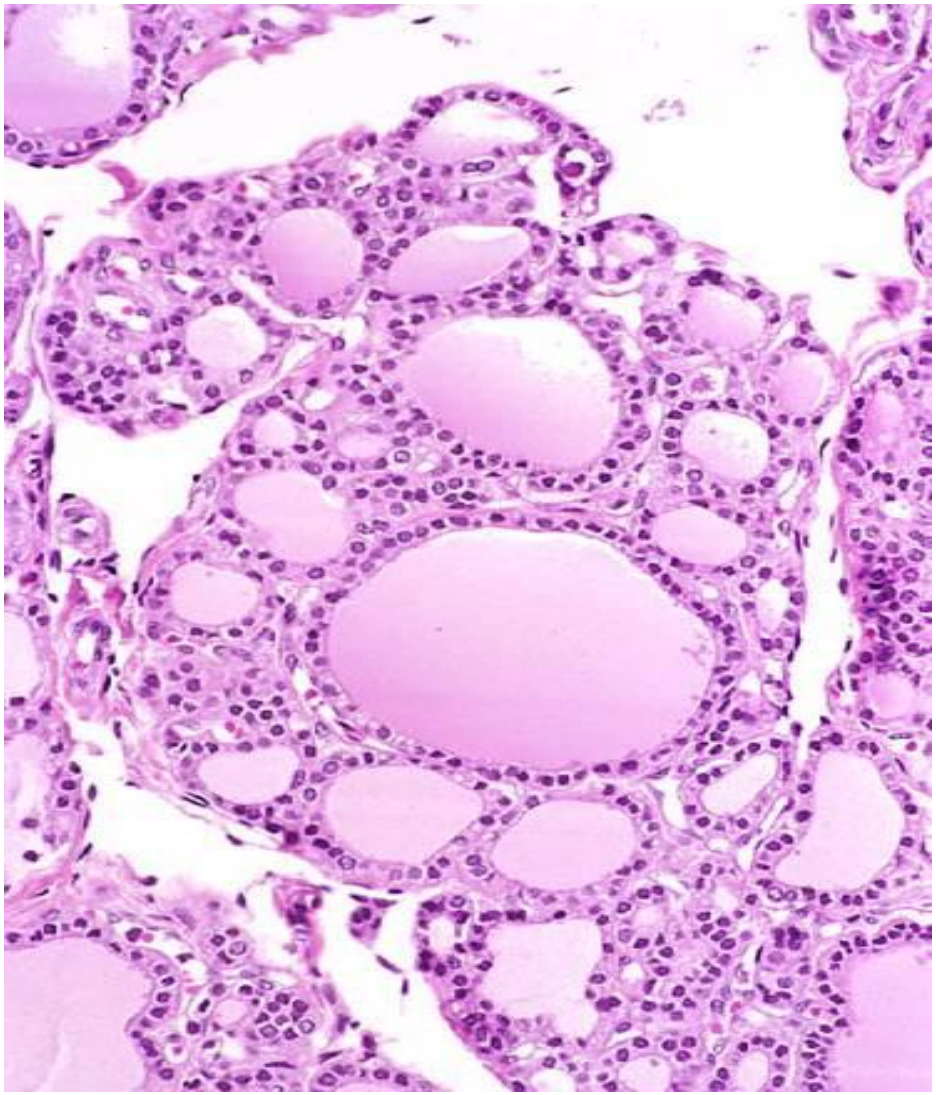


EM of thyroid follicle

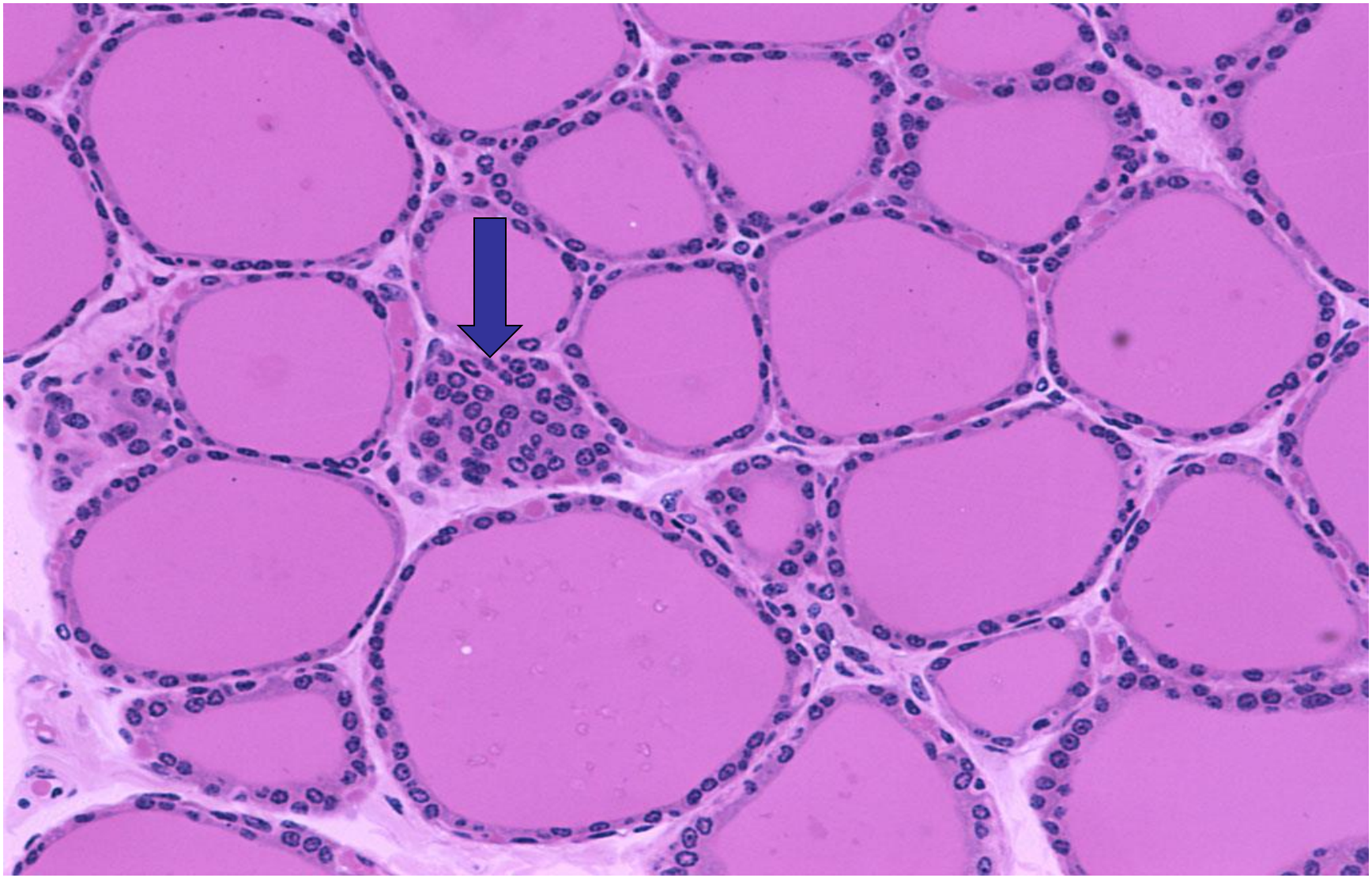


Thyroid

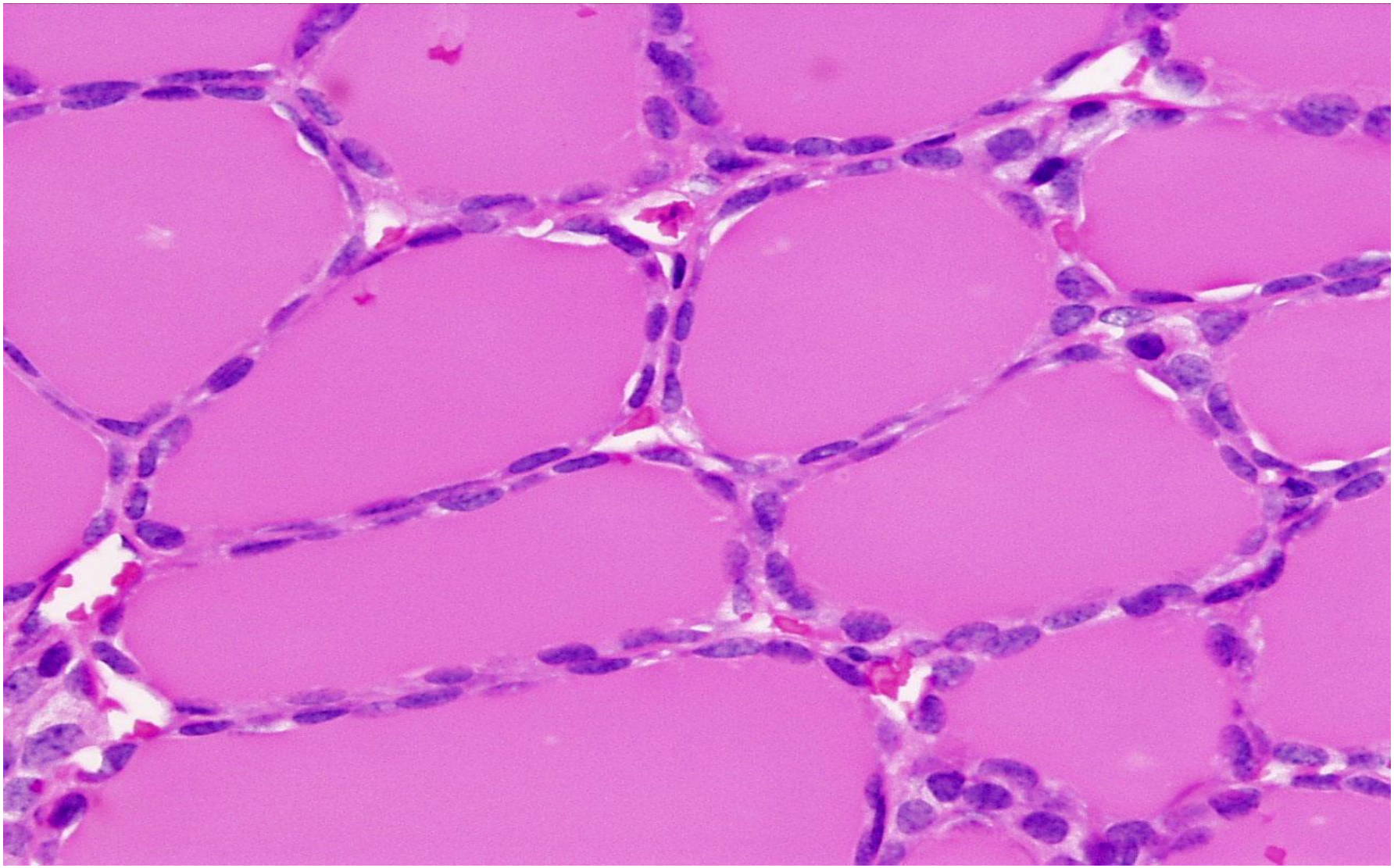

Thyroid Gland
H&E
colloid in follicular lumen
follicular cells



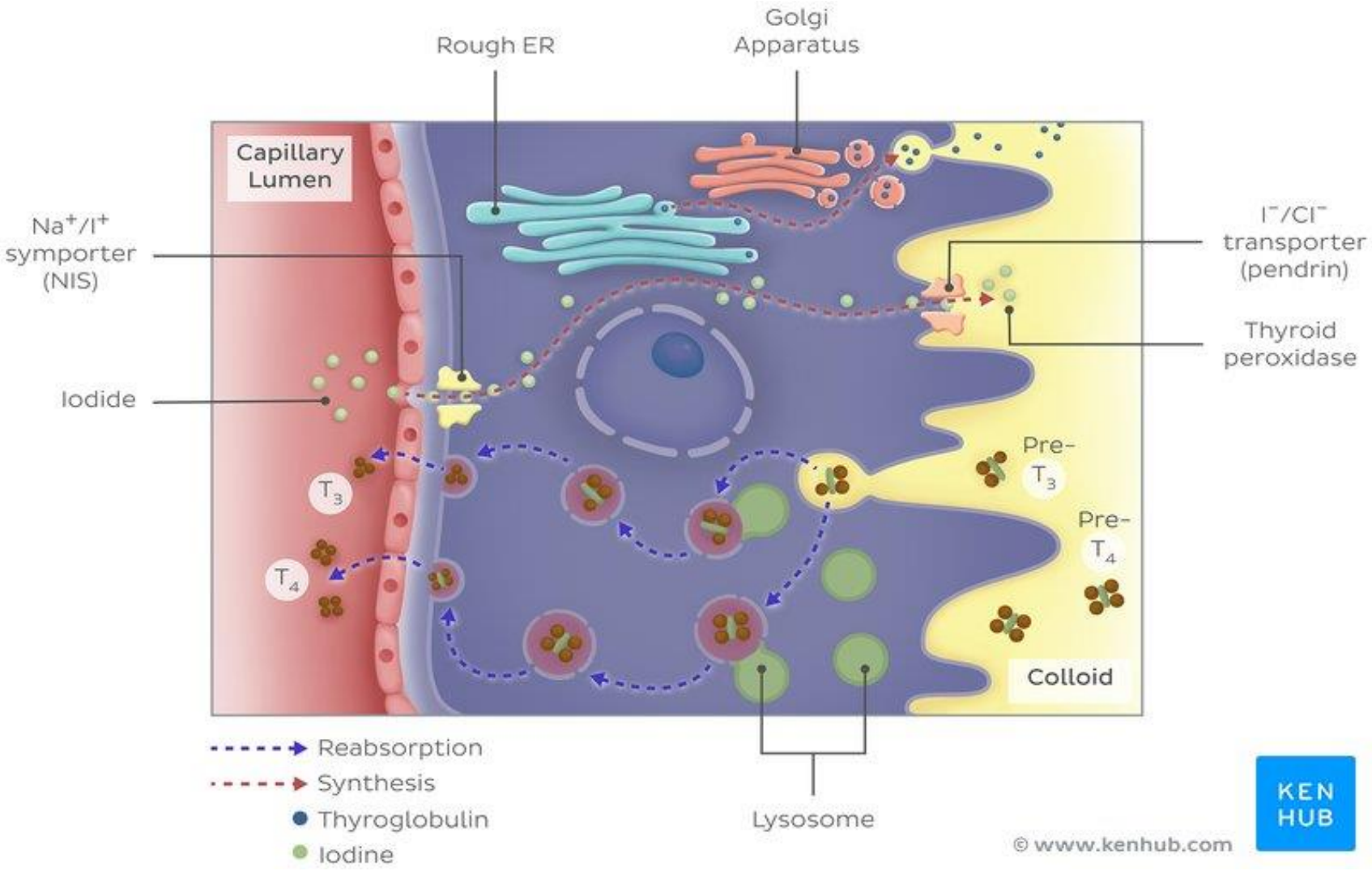
Interfollicular cells



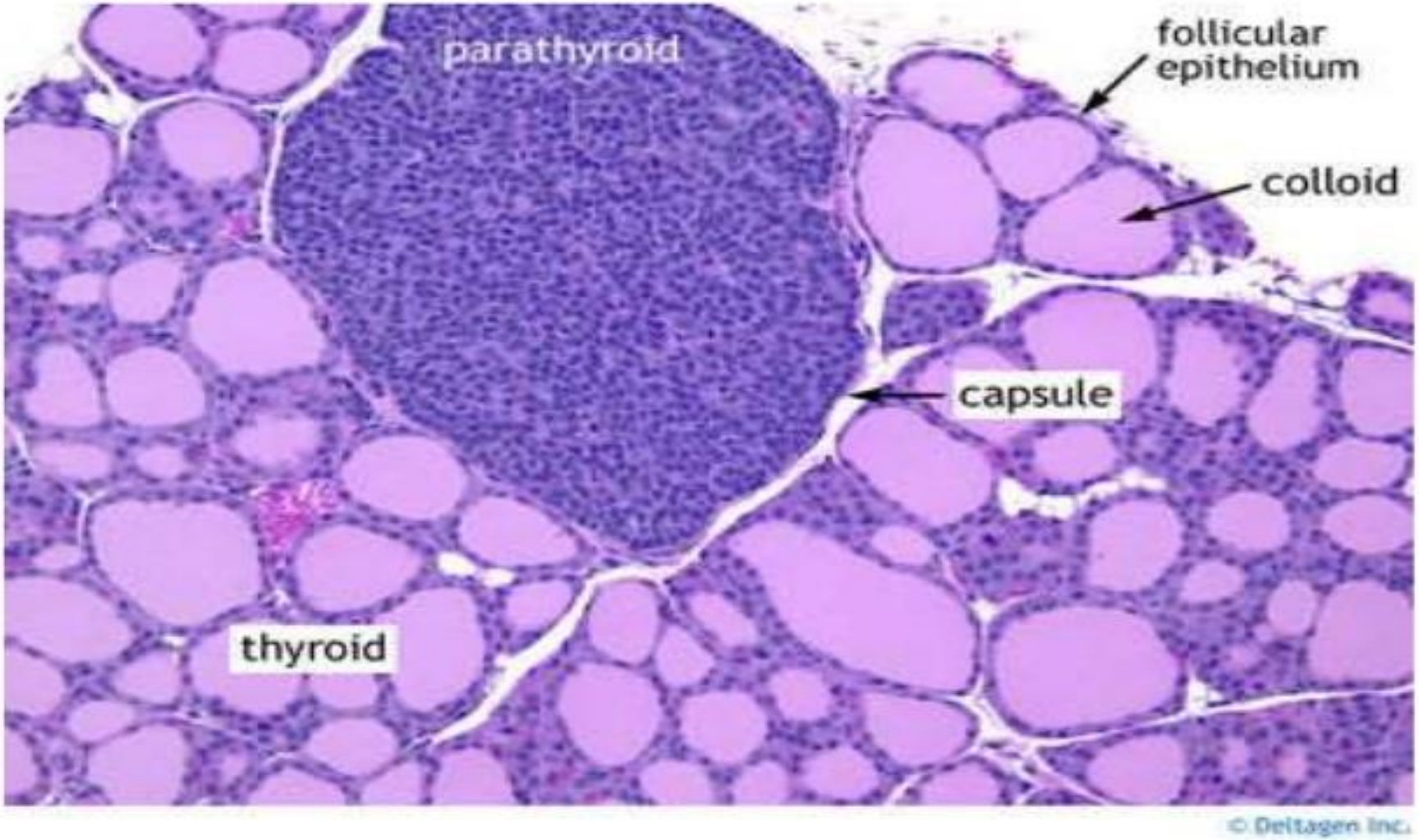
Thyroid



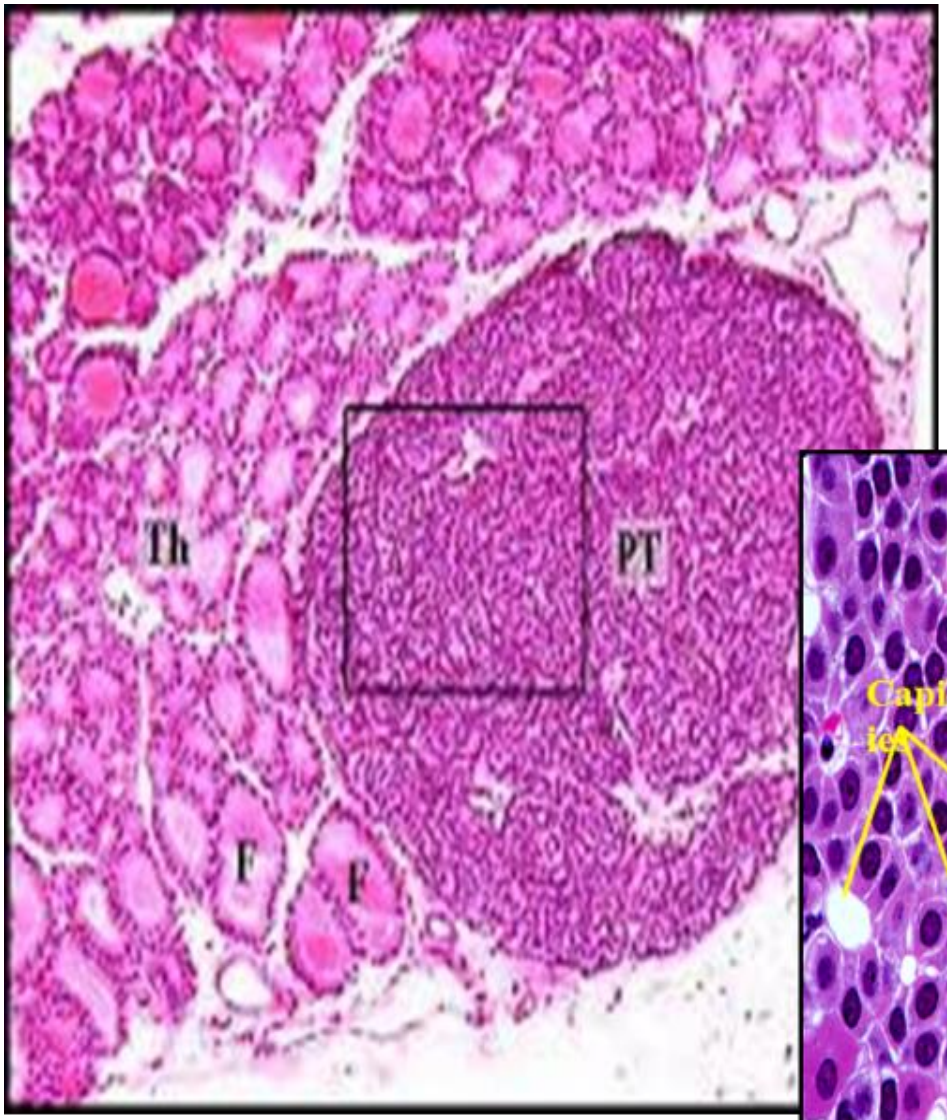
Formation of thyroid hormones



Parathyroid gland

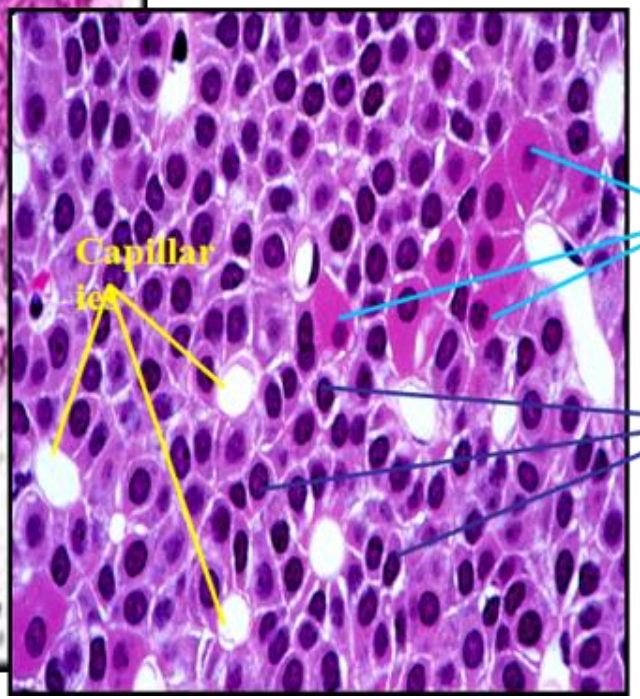


Parathyroid gland



Two types of cells:

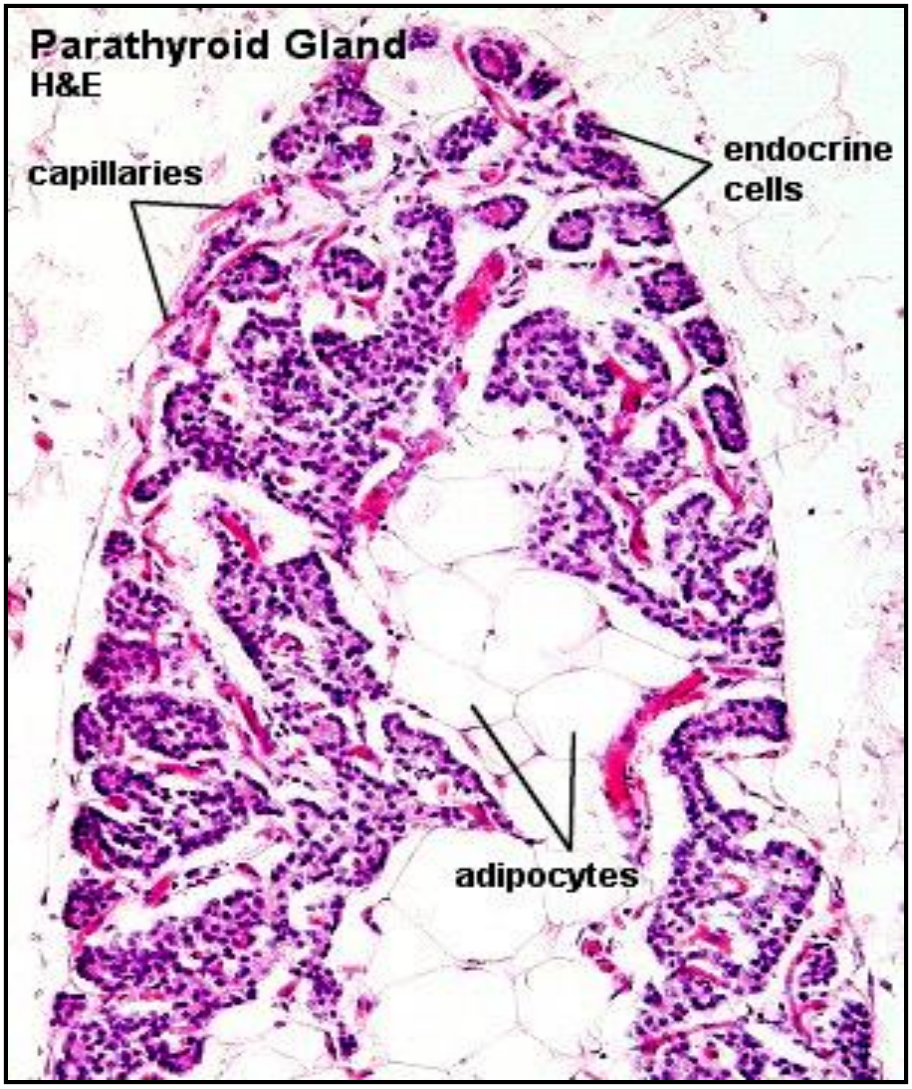
1. Chief cells
2. Oxyphil cells

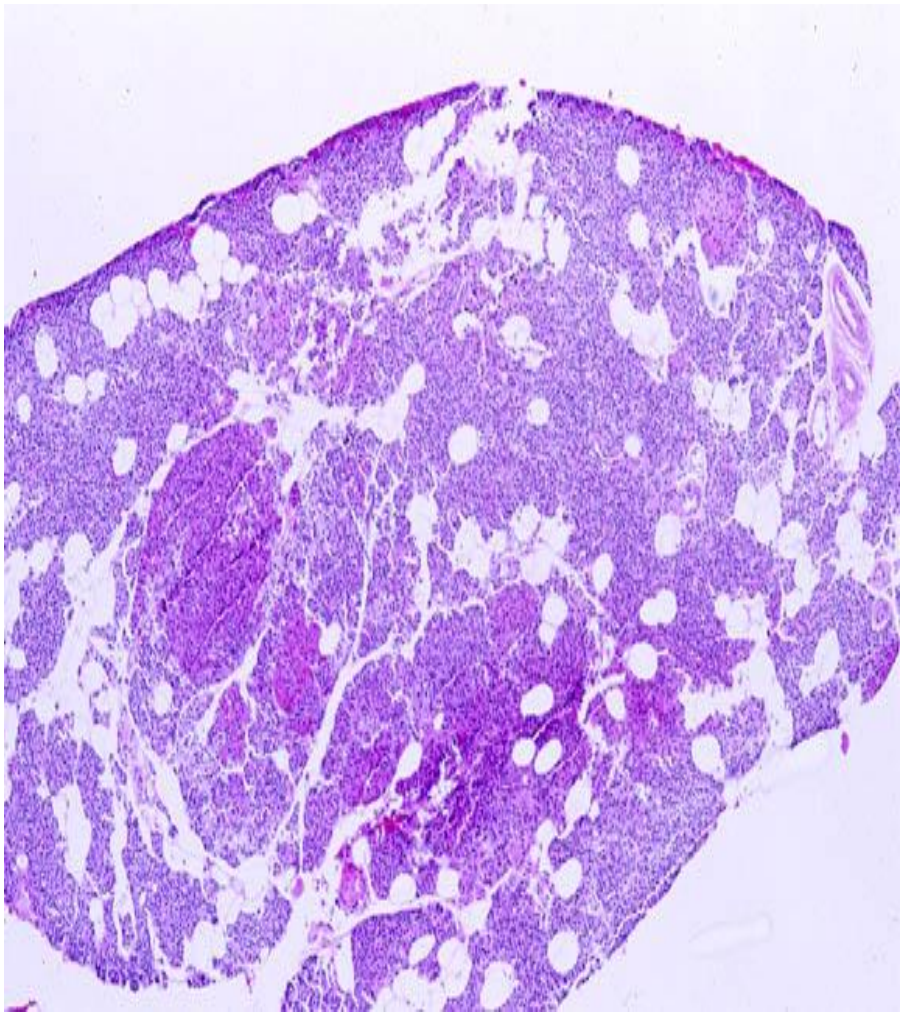


Oxyphilic cells

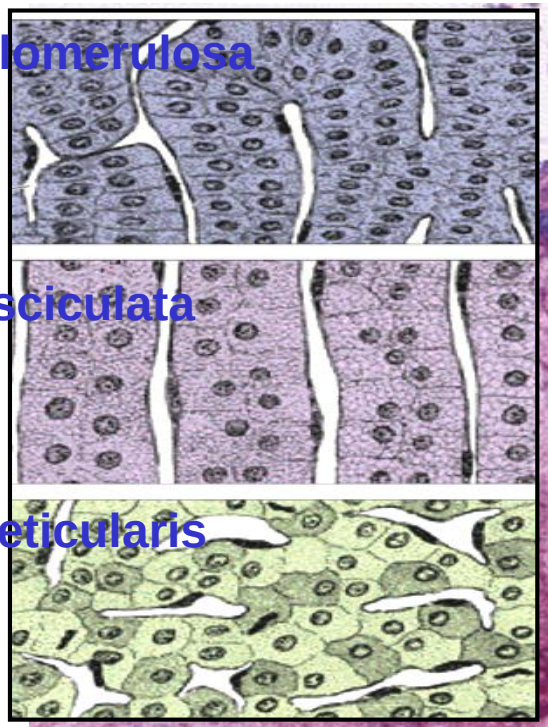
Chief cells

Parathyroid gland in old age

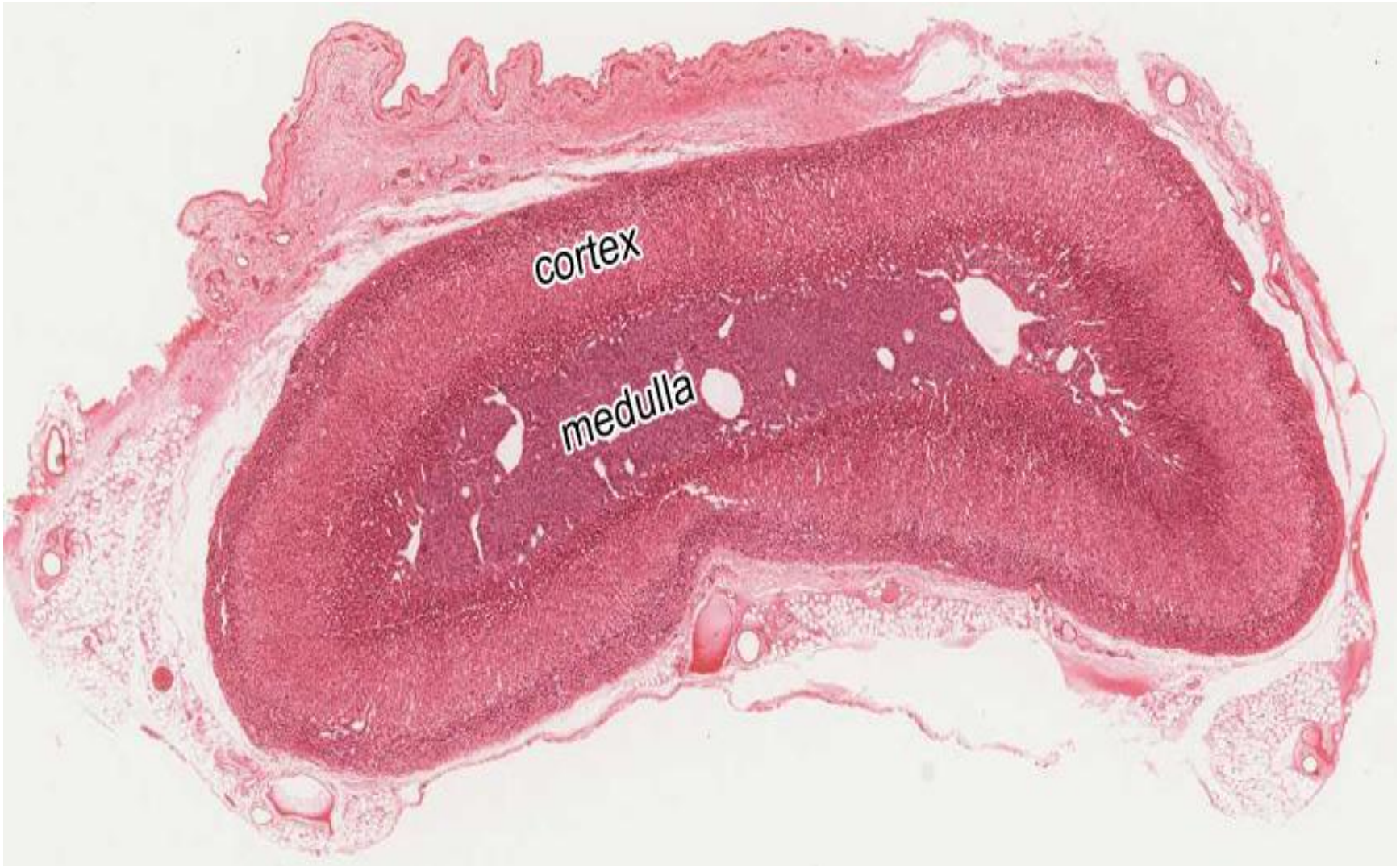




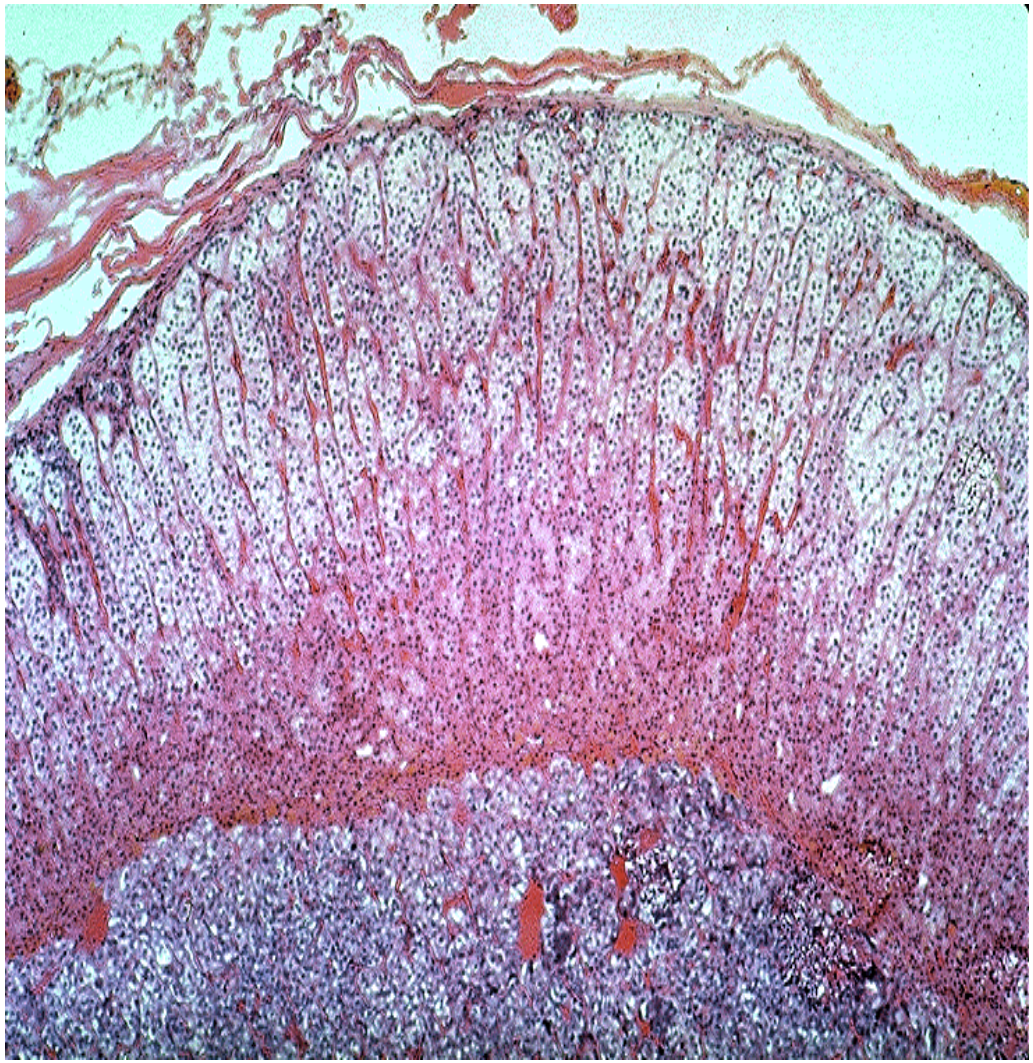
Suprarenal gland

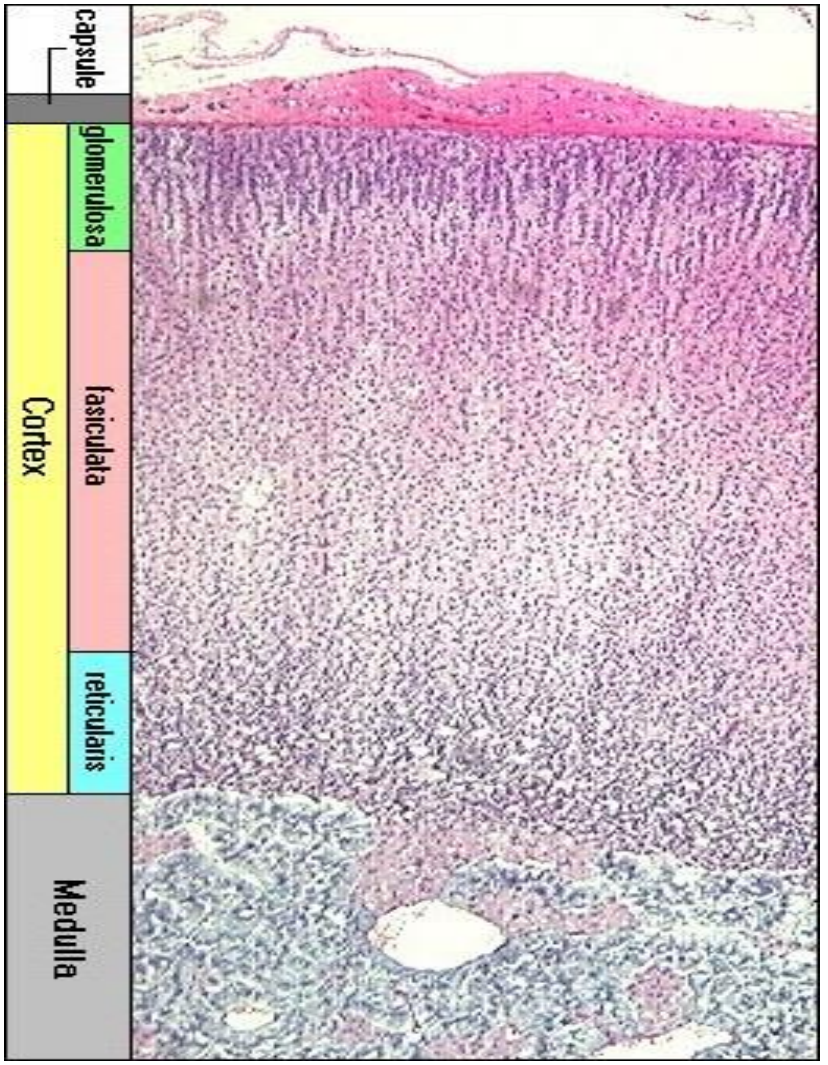


Suprarenal gland

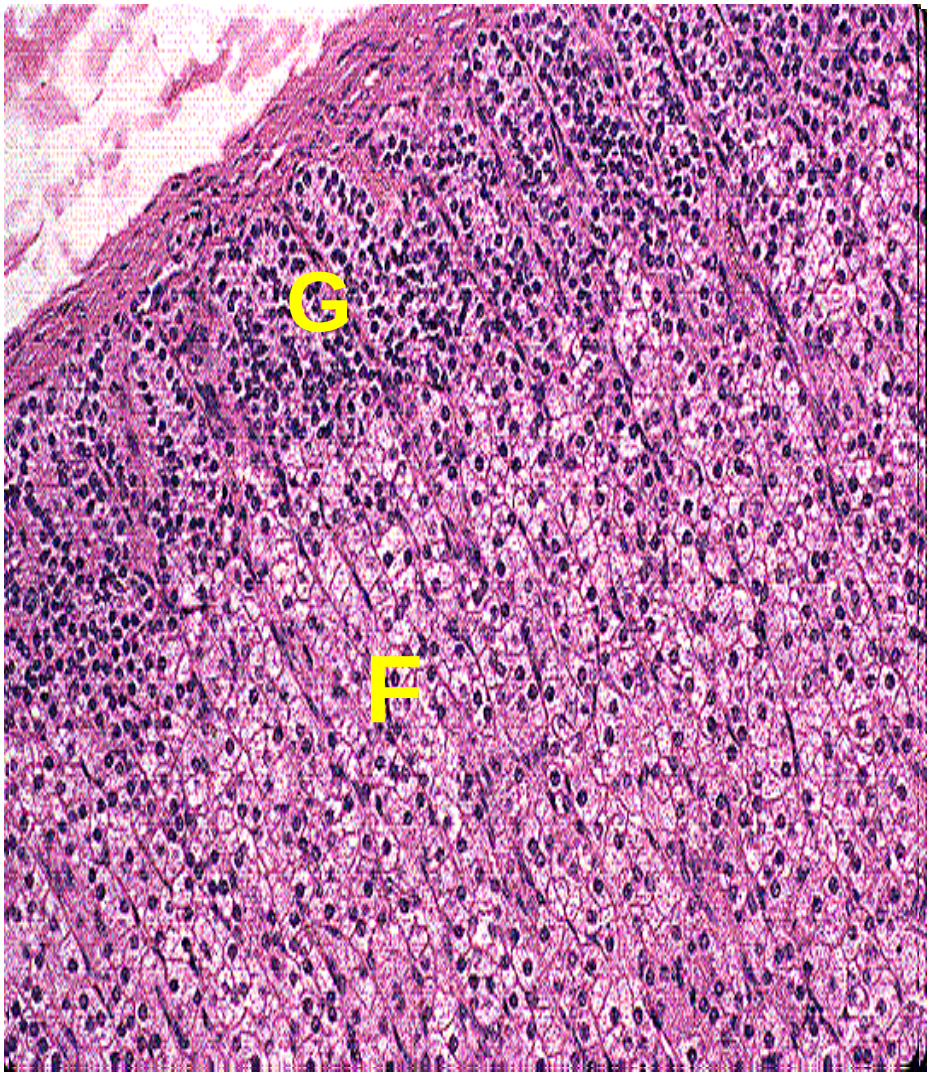


Suprarenal gland

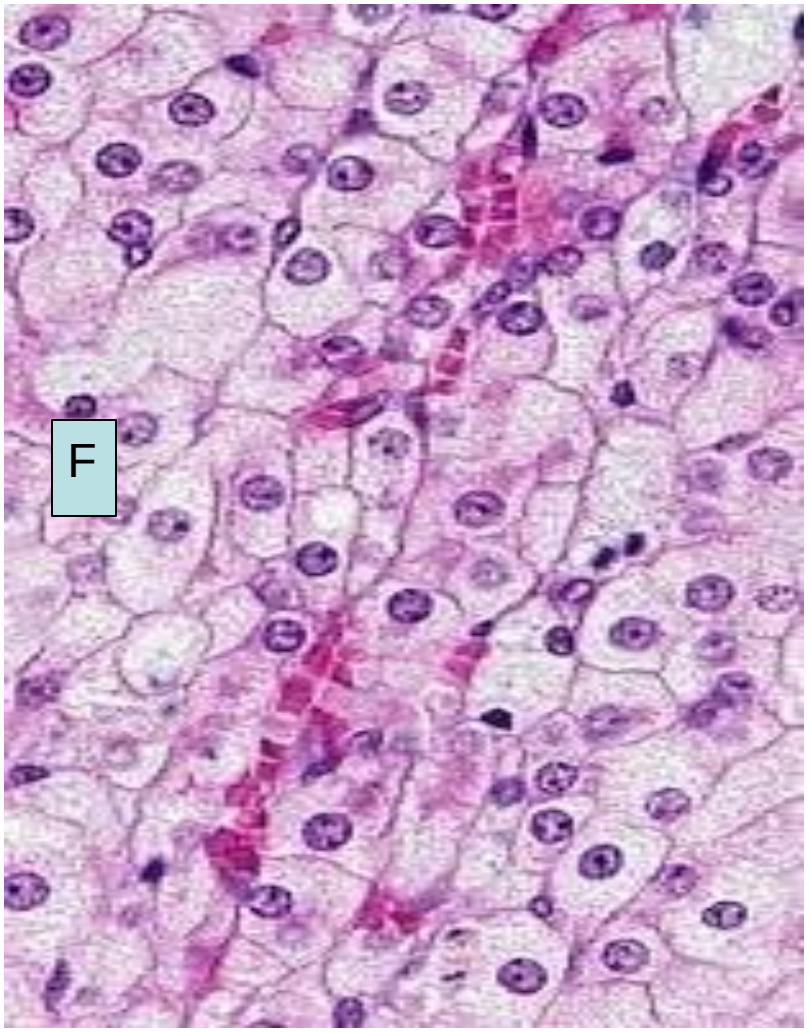




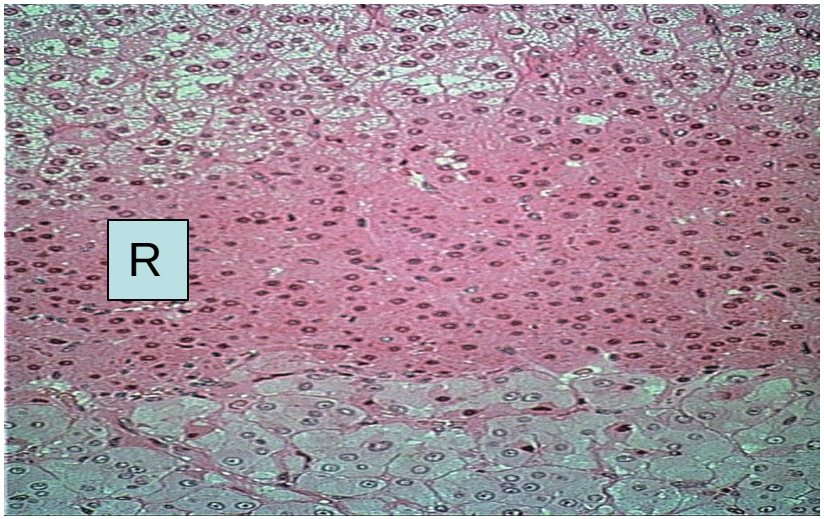
Suprarenal gland

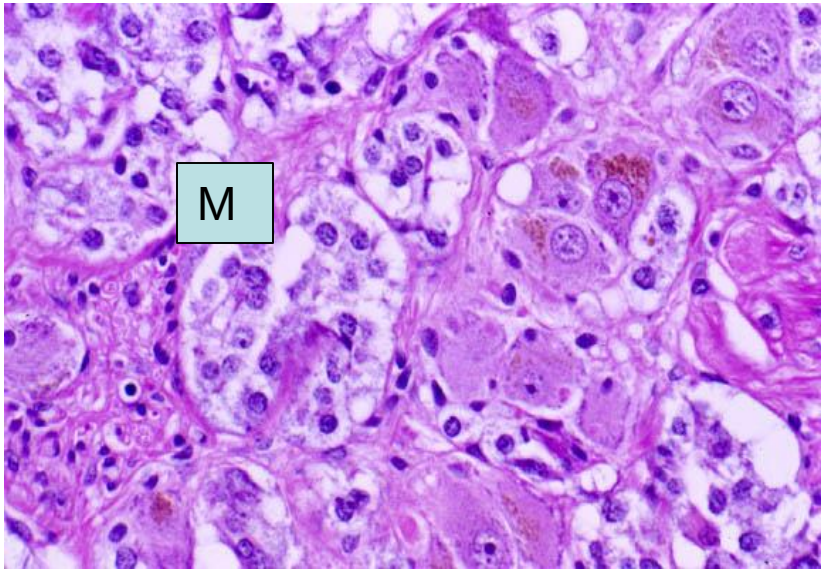


Suprarenal gland



Suprarenal gland





PANCREAS

Stroma:

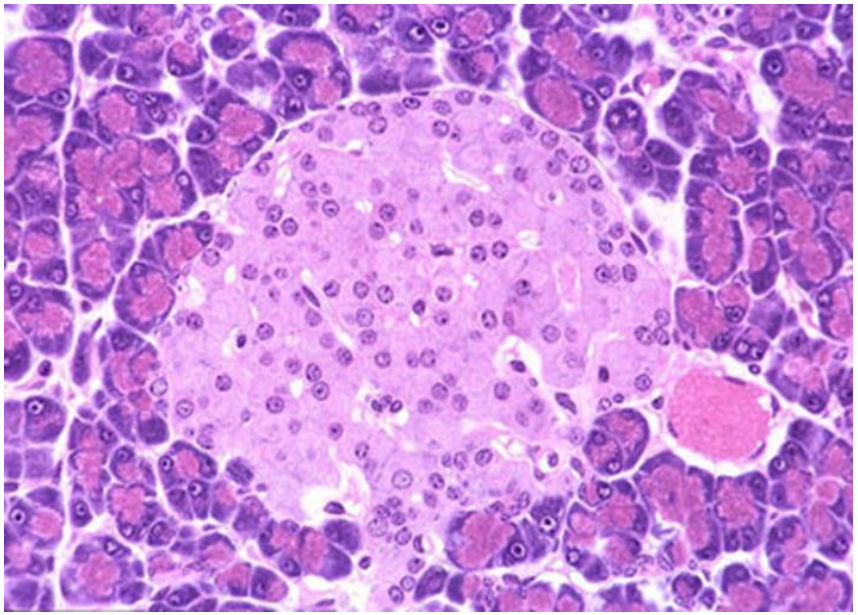
Surrounded by **thin** capsule

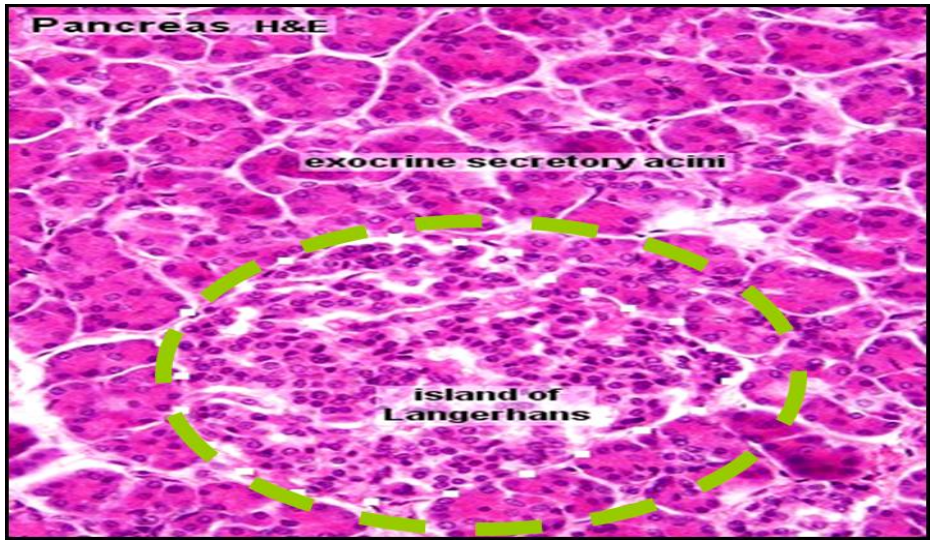
Parenchyma

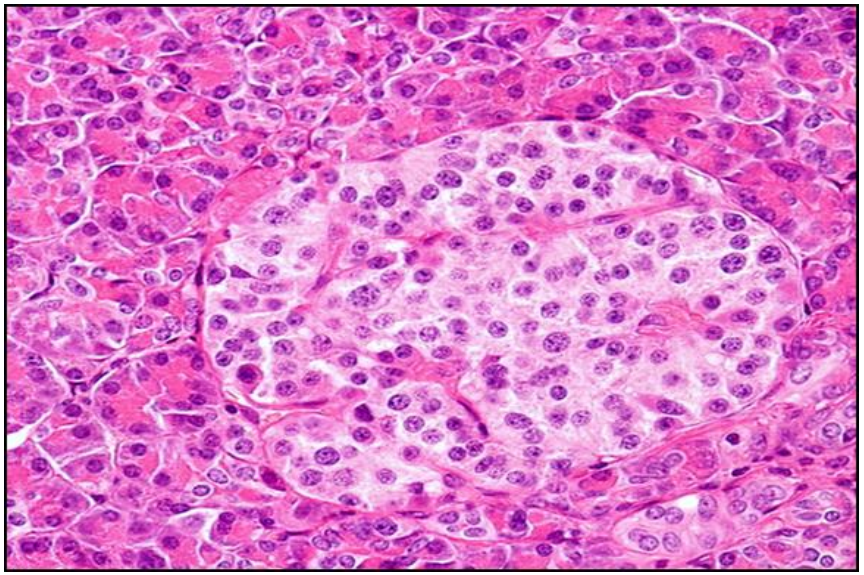
cellular composition of the islands

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

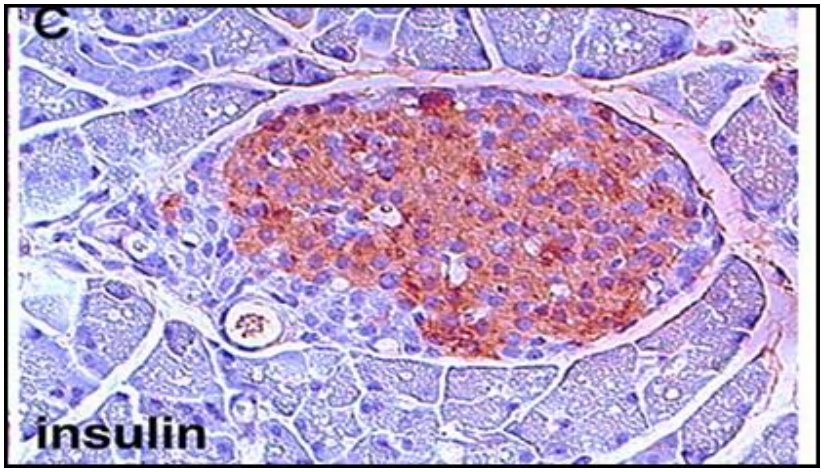
pancreatic polypeptides

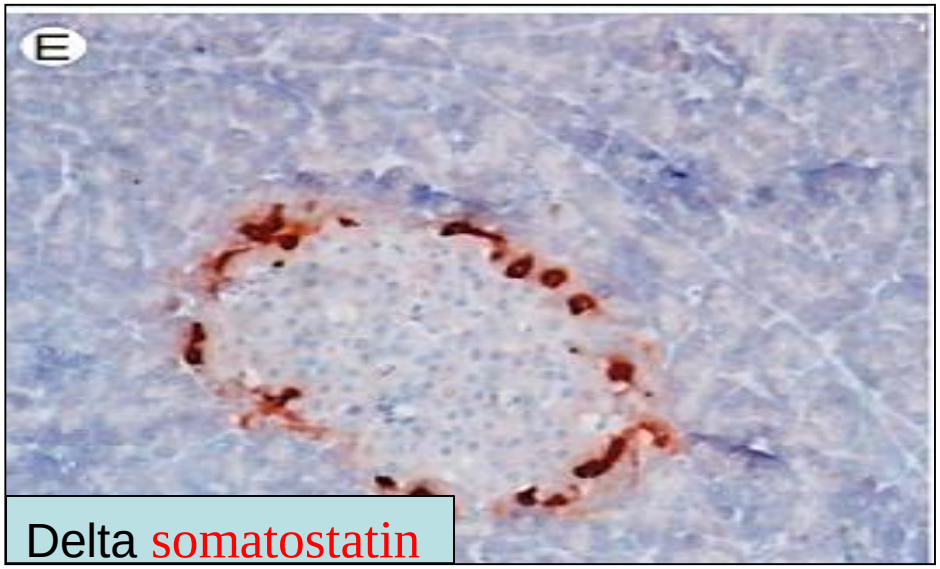


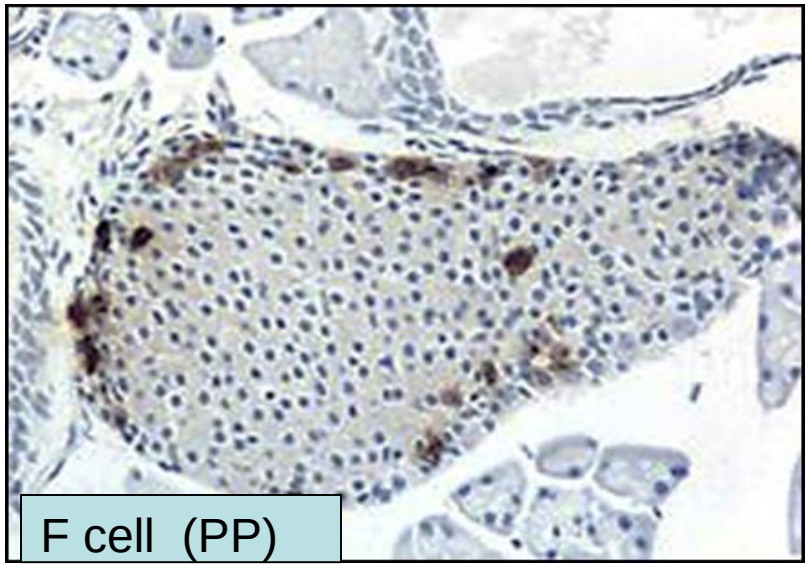




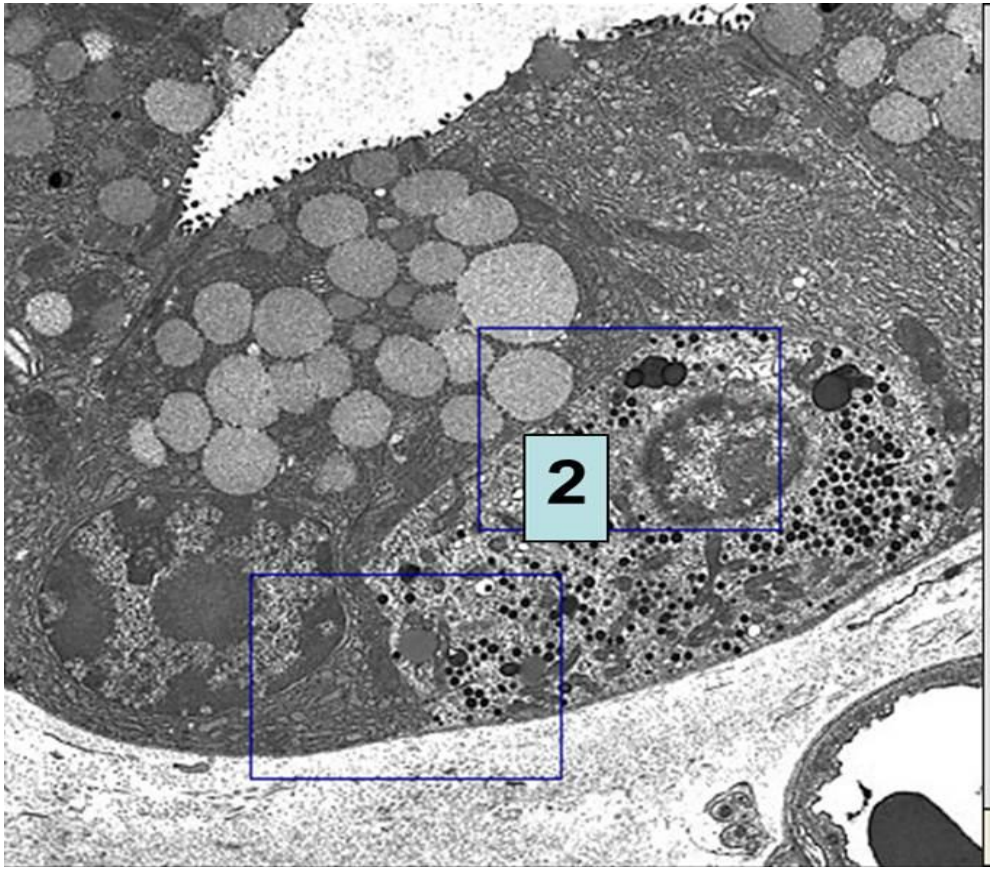

D
glucagon


C
insulin

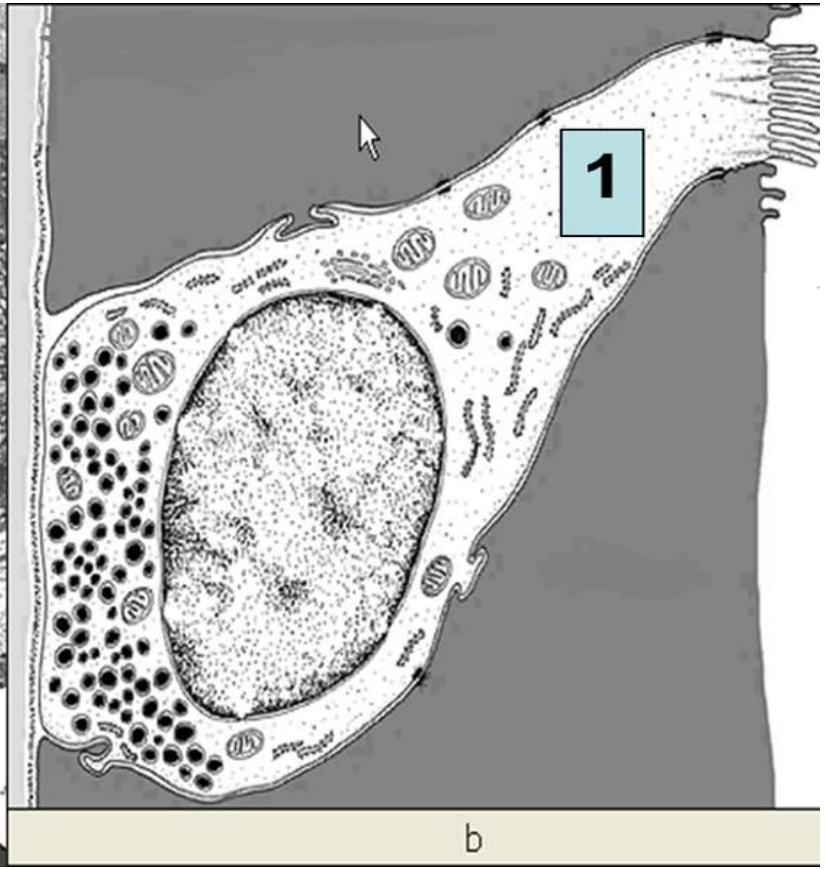

E
Delta somatostatin


F cell (PP)

Closed type



Open type



Entero- endocrine cells