



HISTOLOGY

Endocrine Block – 432 Histology Team

Lectures 2 and 3: Thyroid and Parathyroid Glands

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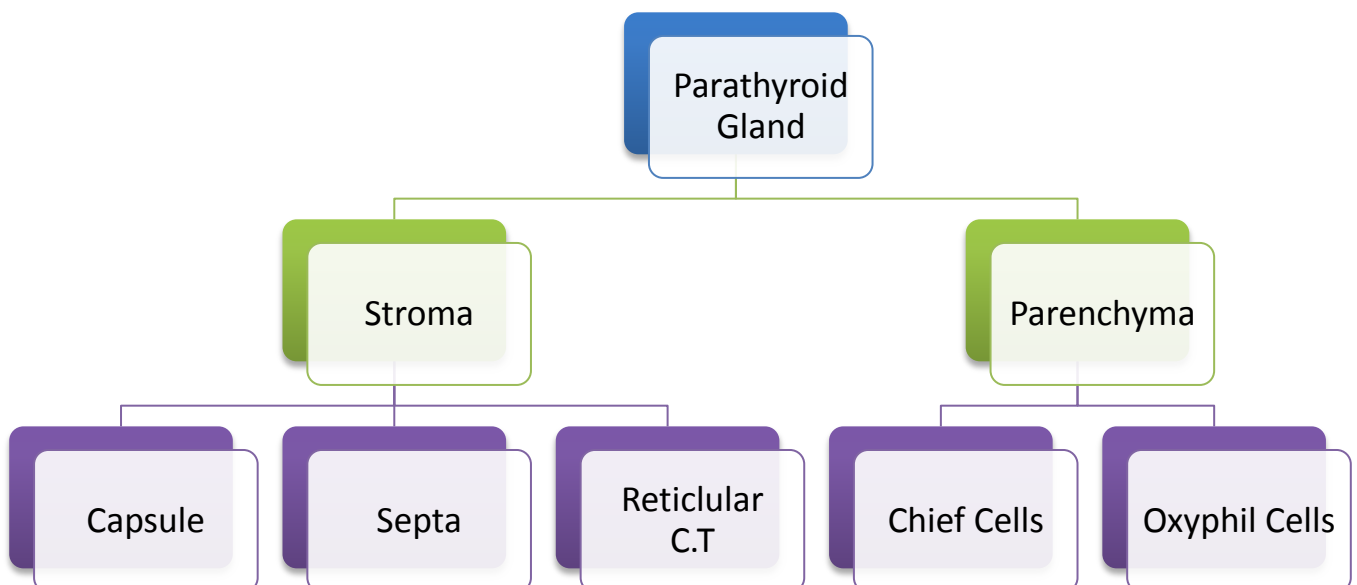
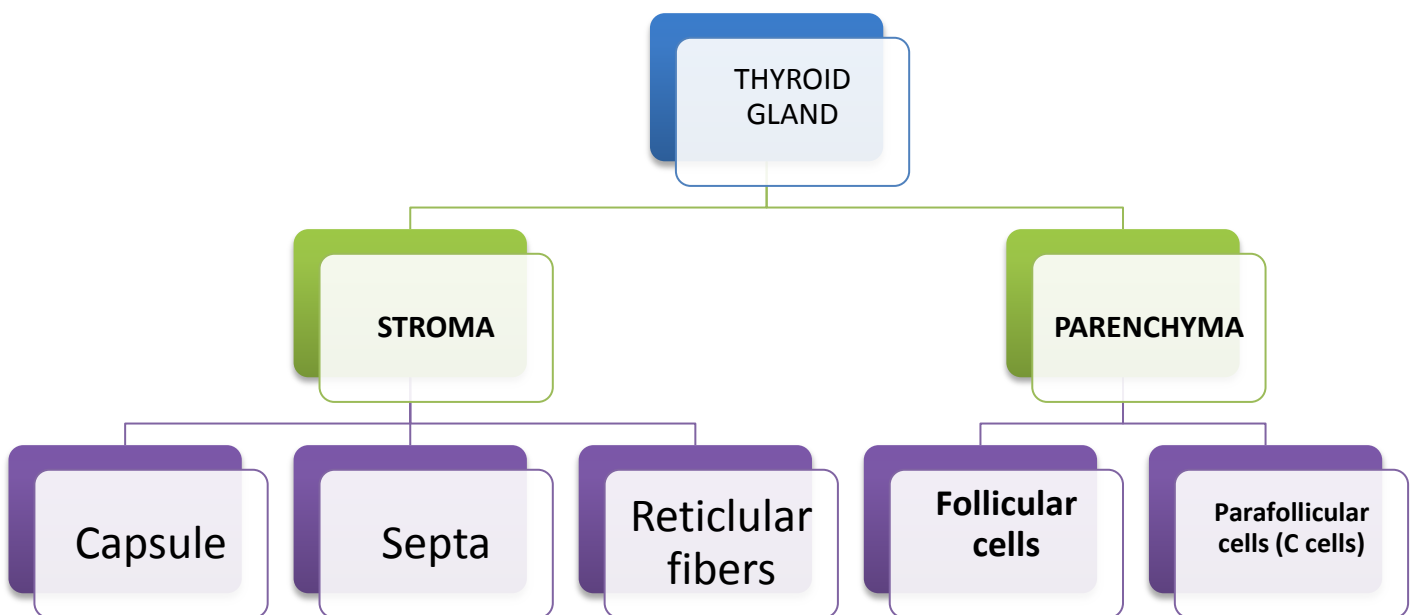
Color Guide:

- **Black:** Slides.
- **Red:** Important.
- **Green:** Doctor's notes (Female).
- **Blue:** Doctor's notes (Male).
- **Orange:** Explanation.

Objectives

1. Describe the histological structure of thyroid gland.
2. Identify and correlate between the different endocrine cells in thyroid gland and their functions.
3. Describe the microscopic structure of the parathyroid gland.
4. Describe the functional structure of the parathyroid cells.

Mind Map



Thyroid Gland

THYROID GLAND STROMA

1- Capsule:

Dense irregular collagenous C.T.

2- Septa (Interlobular septa):

Dense irregular collagenous C.T because it's part of the capsule divides the thyroid into lobules.

3- Reticular fibers:

Thin C.T., composed mostly of reticular fibers with rich capillary plexus (fenestrated blood capillary) surrounds each thyroid follicle.

PARENCHYMA OF THYROID GLAND

THYROID FOLLICLES:

Are the **structural** and **functional** units of the thyroid gland. (Variable in size and spherical in shape).

L/M:

1- Simple cuboidal epithelium:

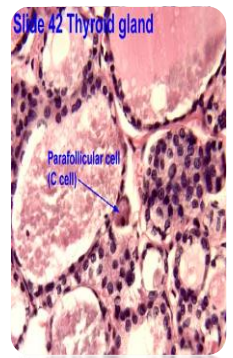
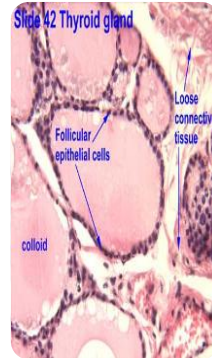
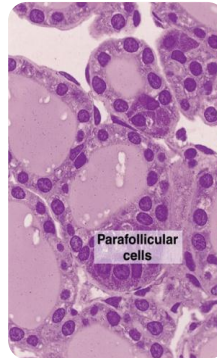
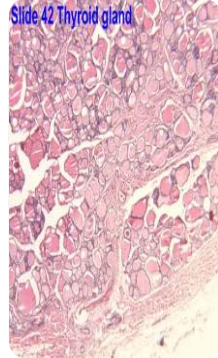
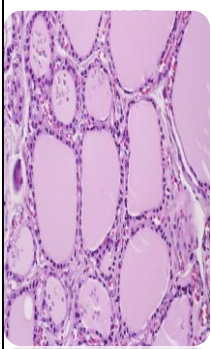
a- Follicular cells.

b- Parafollicular cells. (Adjacent to a).

2- Colloid: central colloid-filled lumen. (Acidophilic without any cells and rich in iodine and thyroglobulin, and so it has the stored hormone & it's also the place of iodination).

N.B.

- Each follicle is surrounded by thin basal lamina.
- Each follicle is single layered.

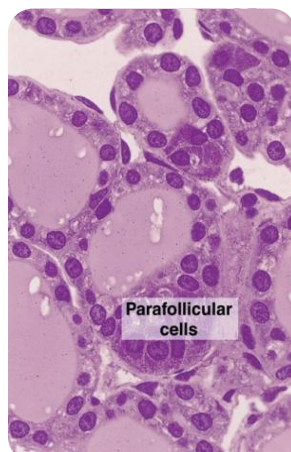
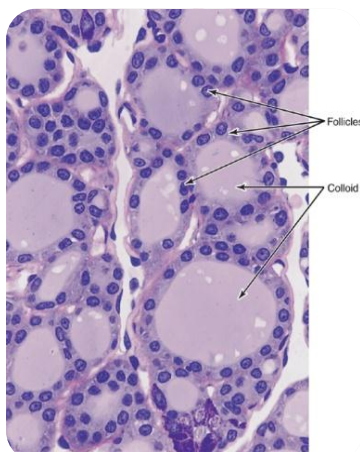


a) FOLLICULAR (PRINCIPAL) CELLS

L/M:

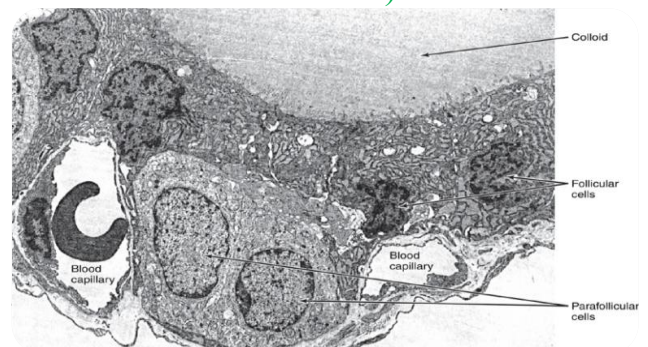
- Simple cuboidal cells.
- Round nucleus with prominent nucleoli.
- **Basophilic cytoplasm.** (Rich in RER and Ribosomes).
- **Apical** surface (secretory part) reaches the lumen of the thyroid follicle towards the colloid.

The base is facing the CT for nutrition).



E/M:

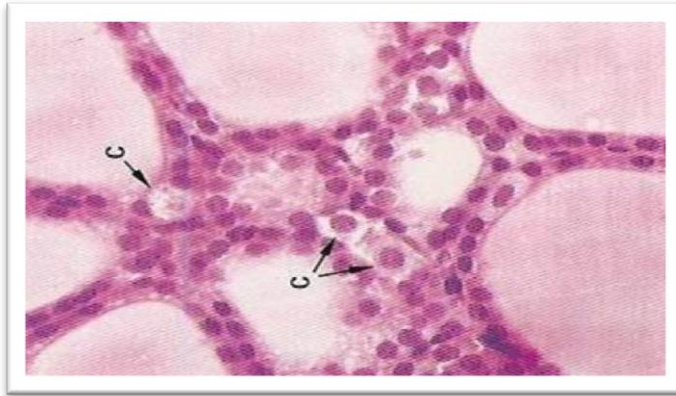
- **Mitochondria.**
- **RER.**
- Supranuclear **Golgi Complex.** (It's apically located and makes the secretory vesicles).
- Numerous apically-located **lysosomes.** (Oxidation of iodide to iodine by lysosomal enzyme peroxidase).
- **Peroxisomes.**
- Numerous dispersed **small vesicles:** Contain newly formed thyroglobulin.
- Numerous **apical short microvilli.** (Increase surface area for secretion).



**b) PARAFOLLICULAR CELLS
(CLEAR CELLS) (C-CELLS)**

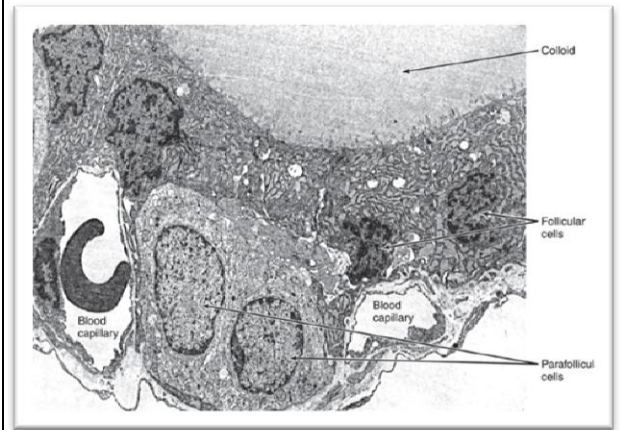
L/M:

- Pale-stained cells → Clear cytoplasm (Clear Cells).
- Are found singly or in clusters sequestered between the follicular cells and basement membrane.
- Their apices *do not reach the lumen of the follicle*.
- Are larger than follicular cells (2-3 times) hence they are few.
- Only 0.1% of the epithelial cells.
- Have round nucleus.



E/M:

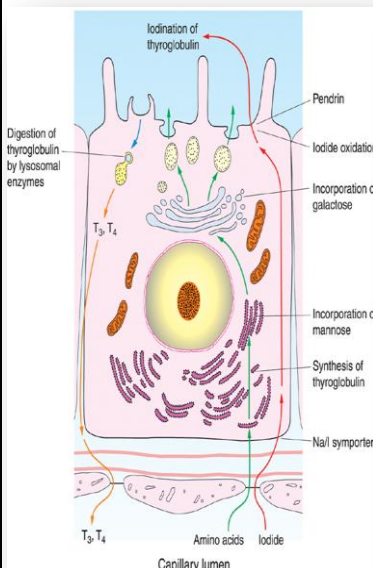
- Mitochondria.
- RER (moderate).
- Well-developed Golgi. (because it's a secretory cell and needs modification of the secretion)
- On EM Para-follicular cells are pale.



Functions

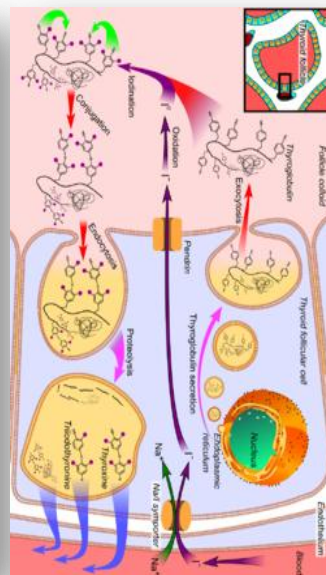
Follicular Cells

Synthesis of thyroid hormones (T4 & T3).



Parafollicular Cells

Secrete calcitonin.



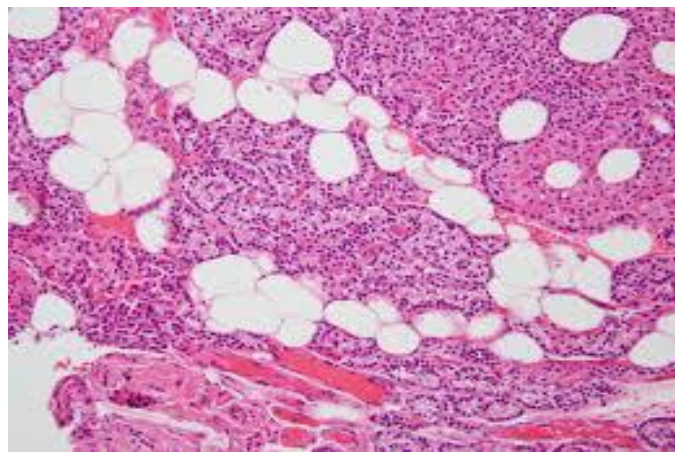
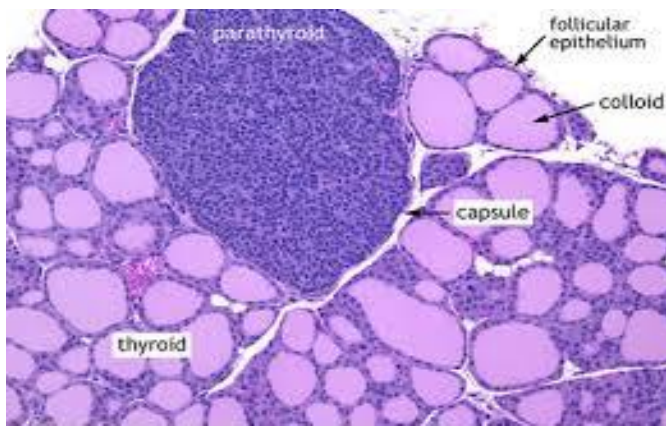
Parathyroid Gland

Parathyroid Gland:

They are 4 glands on the posterior surface of thyroid gland. (They're at least 4 glands).

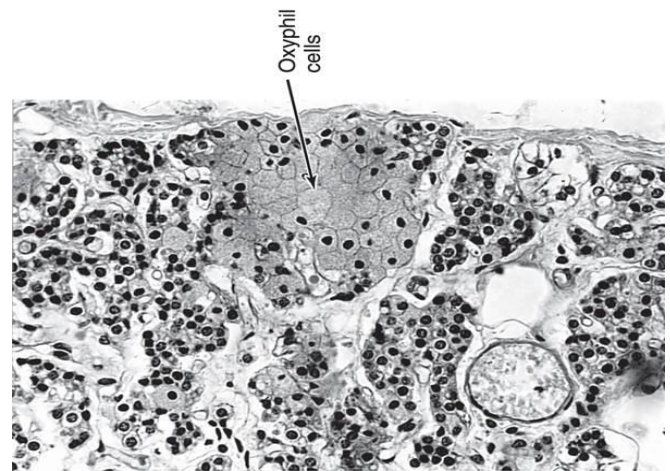
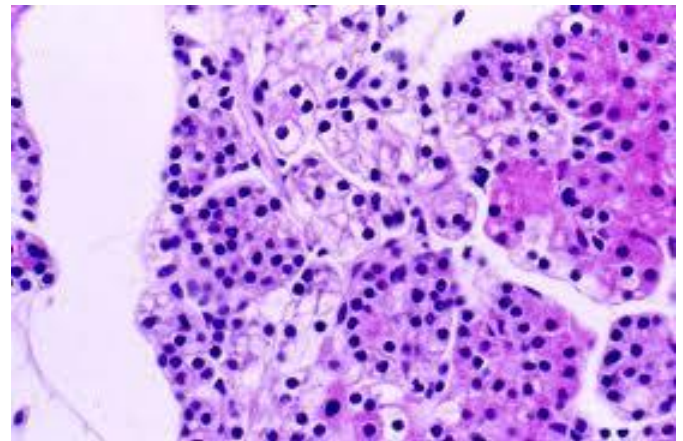
Stroma of parathyroid gland

- 1- **Capsule:** Each gland has its Thin capsule.
2. **Septa:** thin.
3. **Reticular C.T.**
C.T. stroma in older adults often
Contains many **adipose cells**. (Atrophy cells
and its location in adipose cells).



Parenchyma of Parathyroid gland

The parenchyma is formed of cords or clusters of epithelial cells (chief cells & oxyphil cell (**acidophilic**) with blood capillaries in between. These cells are surrounded by reticular fibers.



Chief cells

- Are **slightly** or pale **eosinophilic**.
- Are rich in rER.
- They secrete parathyroid hormone.

(Increase blood calcium)

- **Principal cell.**
- **More prominent.**

Oxyphil cells

- They are arranged in groups or clusters or as isolated cells.
 - They are **deep eosinophilic** (acidophilic).
 - They have more numerous mitochondria.
 - They are **less numerous but larger than chief cells.**
 - They are of unknown function.
- N.B. (They may be inactivated chief cells).
(They appear after puberty).

Questions

Q1: The thyroid stroma contains:

- A. Dense irregular collagenous C.T.
- B. Thin regular collagenous C.T.
- C. Dense regular collagenous C.T.

Q2: The thyroid follicular cell is also called:

- A. Clear CELLS.
- B. Principal CELLS.
- C. C-CELLS.

Q3: The clear cells function is to:

- A. Secrete T3, T4.
- B. Secrete calcitriol.
- C. Store calcium.
- D. Secrete calcitonin.

Q4: The Parathyroid gland stroma contains:

- A. Thin septa.
- B. Dense irregular collagenous C.T.
- C. Interlobular septa.

Q5: Which one of the following are features of chief cells?

- A. Deep eosinophilic.
- B. Slightly eosinophilic.
- C. More numerous mitochondria than oxyphil.

Answers

1	2	3	4	5
A	B	D	A	B



**If you have any questions or suggestions please do not
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Best of luck!

