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Thyroid gland → inferior anterior → larynx.
2 lobes → united by an isthmus.

* Cricoid cartilage

* surrounding the anterior surface of the trachea just below the larynx.

* Synthesizes the thyroid hormones → thyroxine

tetra-iodothyronine or T₄.

tri-iodothyronine or T₃.

↳ which help in control the basal metabolic rate in cells throughout the body and polypeptide hormone calcitonin.

* rounded epithelial thyroid follicles → with simple epithelium and central lumen densely filled with gelatinous acidophilic ~~colloid~~ colloid.

* only gland with large quantity of secretory products are stored.

↳ there is sufficient hormones in follicles to supply the body for up to 3 months with no additional synthesis.

* Thyroid colloid concentrated with large glycoprotein thyroglobulin. → precursor for the active thyroid hormones.

* Thyroid gland → covered by fibrous capsule from which septa extend into the parenchyma.

* dividing it into lobules and carrying blood vessels, nerves and lymphatics.

* between follicles → we have reticular connective tissue.

↳ stroma → very well vascularised with fenestrated capillaries.

to transfer secreted hormone to blood.

* Follicular cells → thyrocytes → squamous to low columnar.

* vary in size and controlled by thyroid stimulating hormone. → anterior pituitary gland TSH.

active glands have more follicles & low columnar epithelium.

* glands with highly squamous follicular cells are
→ hypo active.

* thyrocytes → have apical junctional complexes and rest on a basal lamina.

↳ rounded nuclei and centrally located.

↳ rich of RE reticulum. / apically.

↳ Golgi complexes.

inside the basal lamina of the follicular epithelium

↳ derived from neural crest.

↳ larger than follicular cells and stain less intensely.

↳ smaller amount of ER and golgi complexes.

↳ contain Calcitonin.

↳ when Ca^{+2} high concentration in blood.

↳ inhibit osteoclast function.

↳ less important in human because vitamin D in the regulation of Ca^{+2} in blood.

* goiter \rightarrow iodine deficiencies \rightarrow inhibit thyroid hormone production. * excess production of TSH in anterior pituitary gland lead to enlargement of thyroid gland.

Production of thyroid hormones :-
store / release of thyroid hormones.
 \rightarrow exocrine and endocrine. in the same cell (follicular cells or thyrocytes).

① thyroglobulin \rightarrow release from apical vesicles of thyrocyte to lumen.

② uptake of iodide \rightarrow Na/I symporter in thyrocytes basal lateral cell membranes. transport iodide from blood to thyrocytes.

peroxidase \rightarrow pump I^- from thyrocytes into the colloid.

iodination of tyrosyl residues :-

* membrane bound thyroid peroxidase on the microvilli surface of the thyrocytes. → oxidation of iodide → iodine
↳ in colloid.

* formation of T_3, T_4 ^{the most abundant.}

* endocytosis of iodinated thyroglobulin

* secretion of T_3, T_4 .

TSH increase by cold and decrease by heat and stressful stimuli.

* graves disease → autoimmune disease → hyperthyroidism

Hyperthyroidism → lead to heat intolerance

↳ زيادة حرارة الجسم
TSH hormone من الغدة الكظرية

Hyp. Thyroidism → reduce thyroid hormones level.

↳ local inflammation. thyroiditis.

↳ inadequate or release TSH

↳ weight gain / tiredness, intolerance cold.

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lab lecture :

Per 1

Stain : H and E special stain

microscope → light microscope. bright field.

* *Para intermedia* → many nuclei and many proteins

↳ store hormone in vesicles.

* Chromophils → basophils.
gonadotrophs / Thyrotrophs / corticotrophs.

* Lactotrophs / somatotrophs → acidophils.

* Chromophobes → the cell is degranulated.

* To know the type of cell → lactotrophs or somatotrophs → we should use immunohistochemistry

* Capillaries → sinusoid → bigger and larger

→ Agranular. *لوغلة (لا)*

neurohypophysis → neural tissue / cell bodies / axon

↳ myelinated.

pythiocyte + star cells. → oxytocin / ADH

to see the details → we need higher magnification.

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Thyroid :- Follicles → secretory squamous
↳ related to level of TSH.

* more TSH more stimulation to cells and the cells bigger.

* Capsule X capling. → bigger.

* Follicle → الخلية المبطنة للفقاعة
in between ← Follicle cells الخلية
Para follicle cells.

* Para follicle cells → lower Ca^{+2} in blood.
↳ by calcitonin.

to Ca^{+2} homeostasis → PTH much important than calcitonin.

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* arrangement of cells → لترتيب الخلايا هو إلى بيجم
كيف يقتر أحد نوع الغدة ← لجن مشن منويي يسبع
بنفس الصفة دائماً ممكن سيخدم نوع تاني من الصفة لكن
رج يكون ترتيب الخلايا نفسه لجن بيض Follicles

* Flattened ← لأنه واشفنا ال Blood vessels
ليس ما حينا
nucli
→ to endothelial cells.

* Parathyroid → two types of cells → adipose cells
| → elderly → adipocytes عمة ال
كبيو

* regarding the color → 2 regions.

* CC. more nuclei → small in size.