

HISTOLOGY AND FUNCTION OF THYROID GLAND

Thyroid is a discrete endocrine gland, that comprises the flat, oval shaped lobes, one on each side of the junction between the larynx and trachea, being connected by an isthmus – Secretion of thyroid hormones-thyroxine (T_2), tri-iodothyroxine (T_3) and calcium metabolism in vertebrate body including humans. Thyroid is the only endocrine gland that able to store its secretion outside its principal cells into follicular cavities, and the stored form is different from the actual hormone (thyroxine) that is secreted into the blood stream.

Q.What are the major structural components of thyroid glands?

i) Comprises two lobes which are two asymmetric, with the right is often twice the size of the left lobe.

ii) Lobes are connected across the second and third trachea rings by a bridge of thyroid tissue the Isthmus.

iii) Usually there is a pyramidal process extending upward from the isthmus.

iv) Tissue capsules :

Gland is enclosed by 2 connective tissue capsules. The outer is not well defined and attaches the thyroid to the cricoid cartilages of the trachea.

v) Parathyroids:

2 pairs situated between the two capsules, on the posterior surface of the thyroid.

vi) from inner capsule: Trabecule of collagen fibres pervade the gland and carry nerves and a rich vasculature to the cells.

vii) Arterial blood supply:

Arises from the external carotids and subclavians and enters the gland via superior and inferior thyroid arteries respectively.

viii) Rate of blood-flow through thyroid:

About 4-6 ml/minute/gm of tissue (which is about twice that of kidney).

Q.Give a histological description on thyroid gland.

i) Functional unit of the gland is the thyroid follicle or acinus.

ii) Shape of follicles : as roughly spheroidal sacs.

iii) Cellular composition: Follicle comprises a single layer of epithelial cells (= follicular cells) arranged surrounding a human, which contains colloid material.

iv) Follicular diameter : Varies from 20-900 μ m in human.

v) No. Of follicles in the gland: many thousands.

vi) Arrangement of follicles: Several follicles usually group together in arbitrary units separated by blood vessels and connective tissue.

vii) Each follicle is surrounded by a basement membrane and the parafollicular calcitonin secreting, C-cells lie between this membrane and the follicular cells.

viii) A loose framework of reticular fibres holds the follicle together, and an abundance of short, fenestrated capillaries surround them.

ix) An extensive network of lymphatic vessels is also present.

x) Cell-types : Two, follicular and parafollicular cells.

xi) Location of parafollicular cells: Clusters of these cells are interfollicular in position, but single cells may appear within the wall of a follicle but are not in contact with the colloid inside the human.

xii) Follicular cells : Cubical in normal active glands, Tall and columnar with microvilli projected into the colloid in case of hyperactive gland, iii) Flat in hyperactive gland.

xiii) Follicular cells synthesize and secrete thyroxine (T_2) and tri-iodothyronine (T_3).

xiv) Parafollicular cells- Synthesize and secrete the hormone –calcitonin which reduces calcium conc. In blood.

xv) Luminal colloid :- composed of entirely the iodinated glycoprotein –the thyroglobulin, which is PAS positive.

xvi) Nerve supply :- post ganglionic sympathetic nerve fibres from cervical ganglion supply blood vessels, from cervical ganglion supply blood vessels, and control the blood flow through the gland.