Department of Zoology

Online lecture

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Prepared by-

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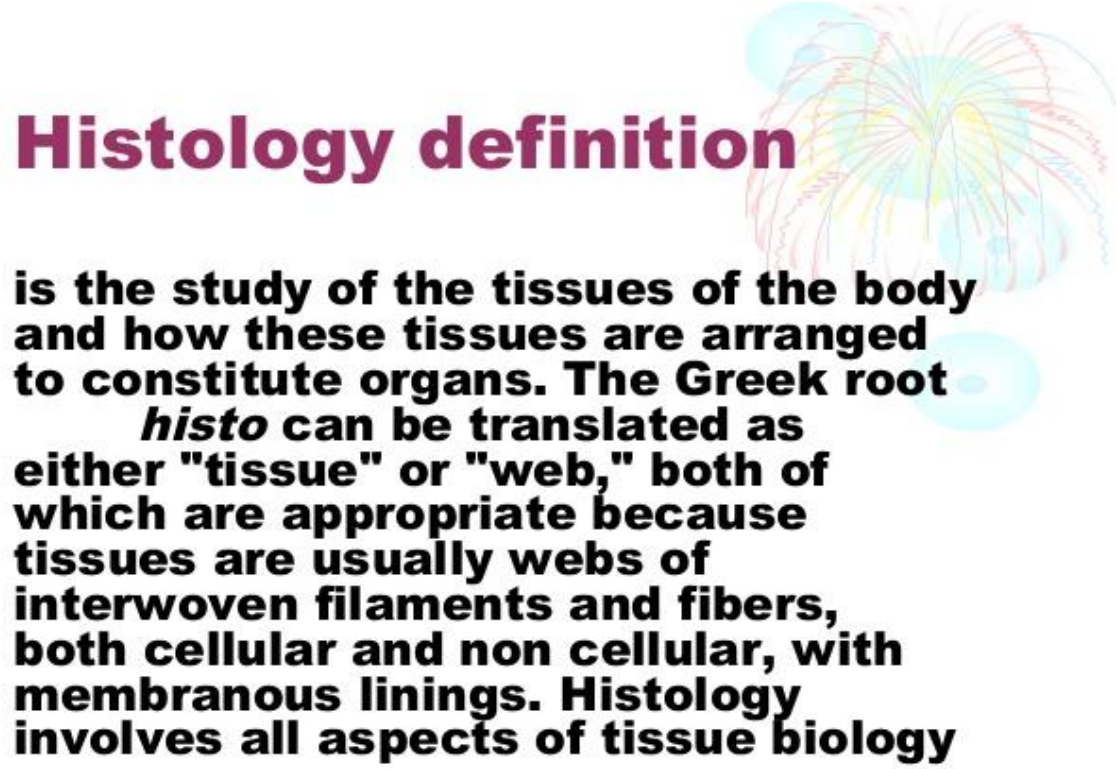
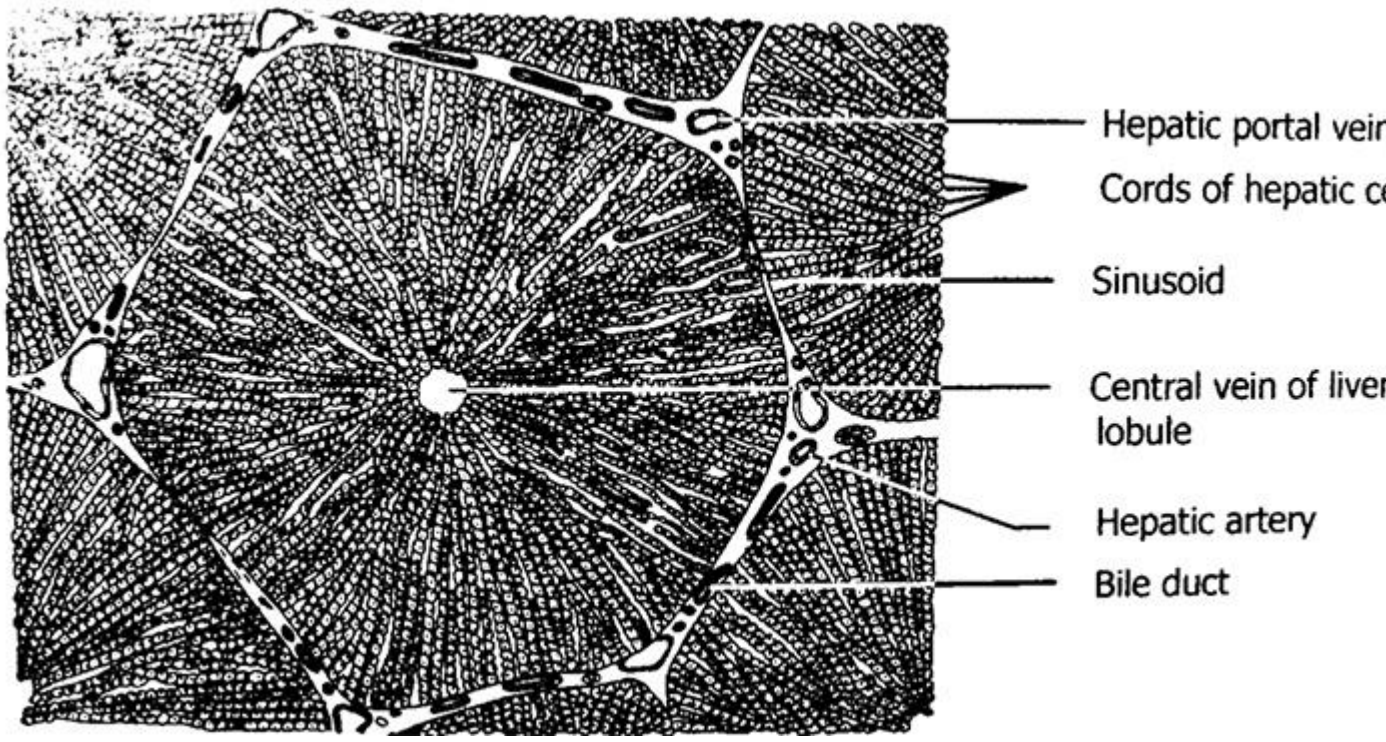
HISTOLOGY:

Histology is the scientific study of biological tissues. ... **Histology** is the study of the microscopic structures of cells and tissues of plants and animals



Identification of histological slides of mammalian tissues:

Lever :



Identifying Characters:

The section showed the following characters:

1. Secretory units called lobules are present, each lobules are hexagonal in shape.
2. Each lobule contains cord of polyhedral cells that converges on the central vein.
3. The hepatic cords are separated by slit like sinusoids, which have some phagocytic cells called the kupffer cells.
4. The polyhedral cells constitutes the trabeculae which have exocrine functions.
5. Peripheral to the lobules lies the arteries, veins, ductules and the bile duct.

Hence the specimen is a transverse section of mammalian **liver.**

Pancreas::

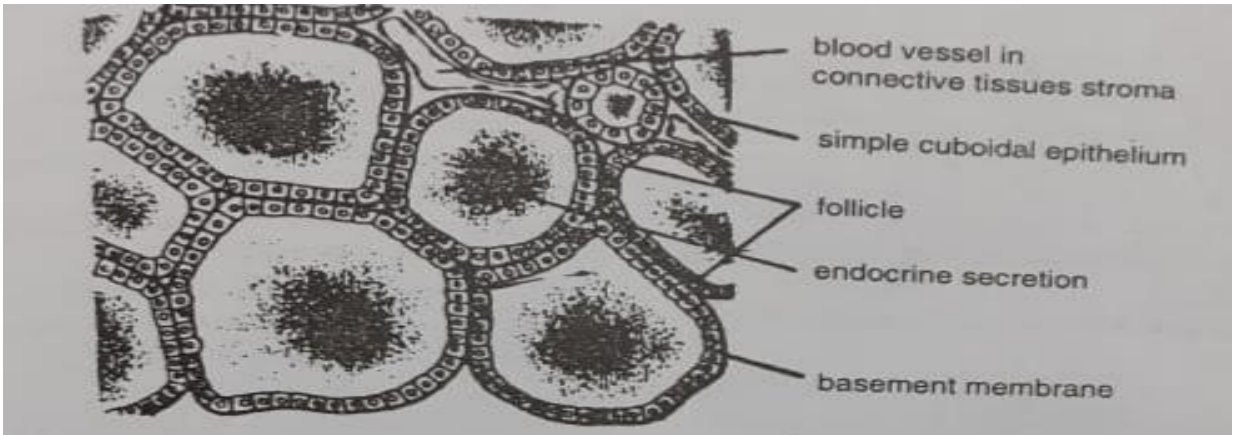


Fig. 41.15 : Thyroid gland. Mammalia. Transverse section

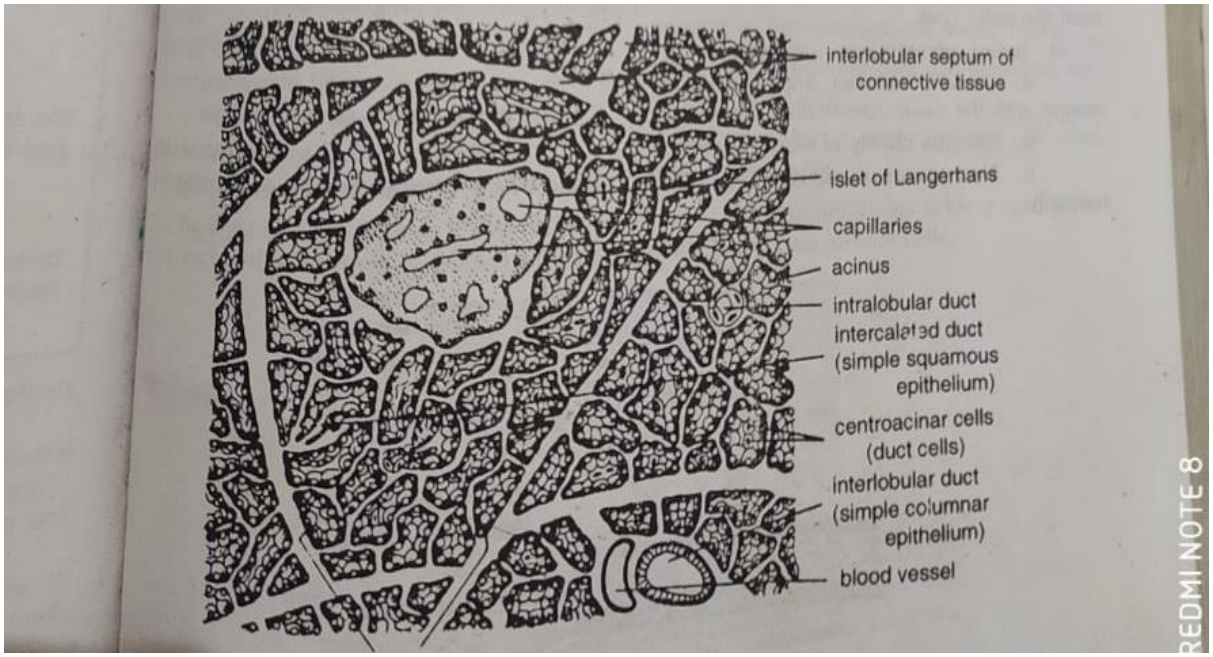
Identifying Characters:

- The section showed the following characters:
- Two distinct regions are observed: the exocrine pancreas and the endocrine pancreas.
- The exocrine pancreas is composed of numerous acinus.
- The acinus is composed of small pyramidal cells, the acinar cells; whose nucleus is situated at the base of the cell.
- The acinar cells shows all the characteristic features of a protein secreting cells: presence of golgi bodies, ribosomes, RER,etc.
- The endocrine pancreas is a pale staining region also called as the islet of langerhans.
- Routine stains shows the presence of two types of cells
    1. the acidophil cells or the α cells and
    2. The basophilic cells or the β cells.

- Using immunocytochemical techniques four types of cells are identified – the A, B, D and F cells.
- α cells have regular granules with a dense core surrounded by a clear region bounded by a membrane.
- β cells have irregular granules with a core formed of irregular crystals of insulin.
- Presence of a complex network of capillaries with fenestrated endothelium.

Hence the specimen is a transverse section of mammalian pancreas.

Thyroid gland:



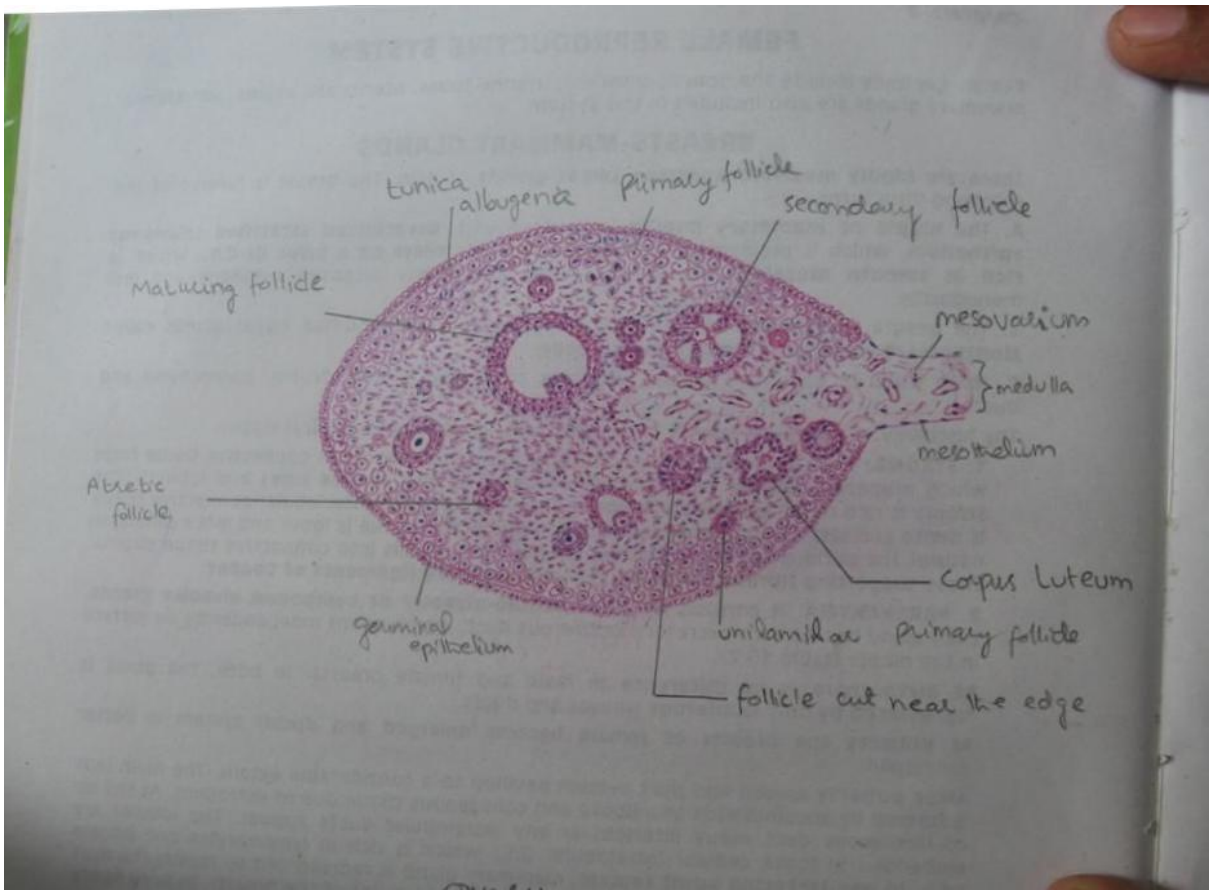
Identifying Characters:

- The section showed the following characters:
- Presence of numerous spherical follicles, the thyroid follicles.
- In each follicle, lie cuboidal or columnar follicular cells on the basement membrane.
- The follicles have a central dark staining nucleus.
- The basal part of the follicular cell is rich in RER.
- The apical pole has discrete golgi complex and small secretory granules.

- Presence of a lumen filled with hmogenous proteinaceous material rich in thyroglobulin.
- Thyroglobulin is the storage form of thyroxine and is an iodinated glycoprotein.
- Another kind of cells, called the parafollicular cell is present either as a part of the epithelium or as an isolated cluster between thyroid follicles.

Hence, the specimen is a T.S of mammalian thyroid gland.

Ovary:



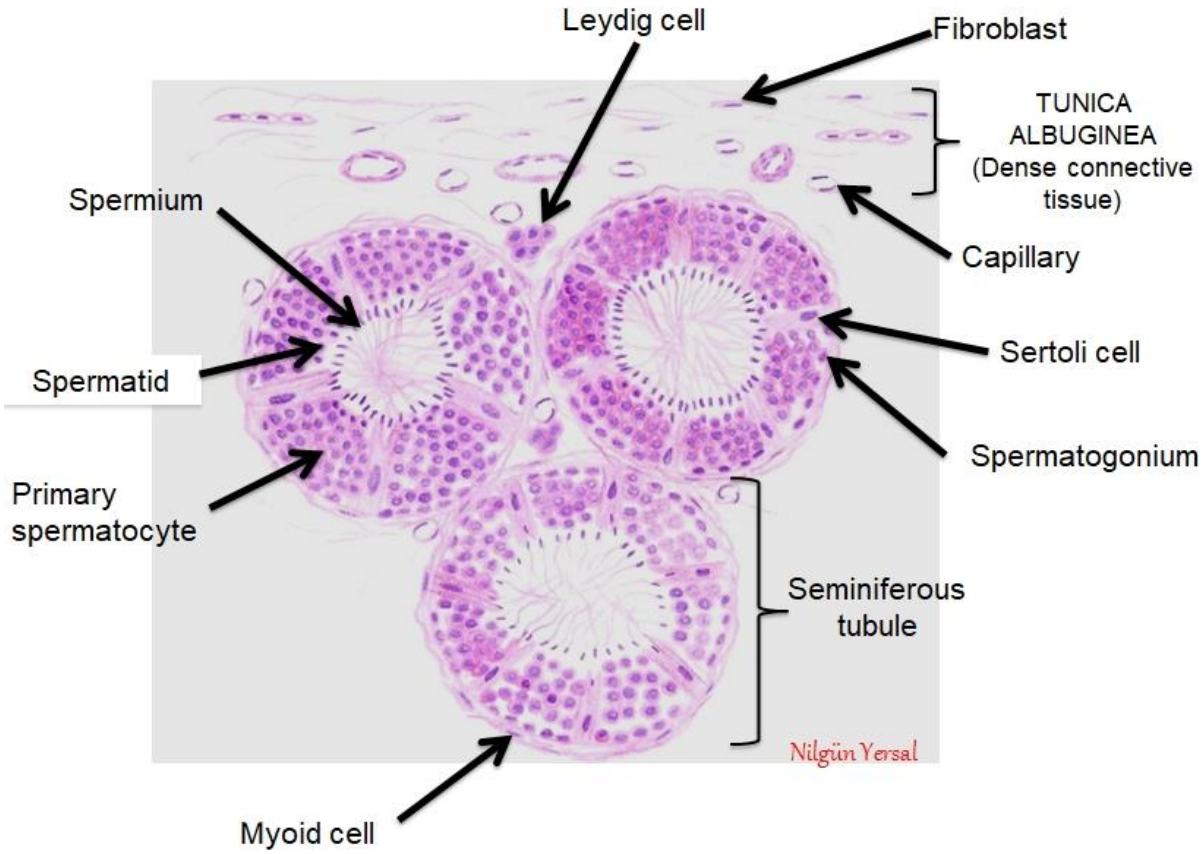
Identifying Characters:

The specimen shows the following characters:

- The surface of the section is covered by simple cuboidal epithelium.
- Beneath the epidermal cover, occurs spindle shaped fibroblasts like stromal cells.
- Between the stromal cells numerous fine collagenous fibers are arranged parallel to the surface to form the tunica albuginea.
- The highly vascular medulla is relatively small with loosely arranged connective tissues, some elastic fibers and some smooth muscles.
- Many primary follicles are present in the peripheral cortex forming a thick layer beneath the tunica albuginea.
- Some of the follicles are primordial follicle, each of which has large central cell surrounded by a single layer of squamous follicular epithelium, i.e., granulosa cell.
- One of a very few maturing follicle enlarge with large eccentric cell in the antrum and is supported by cumulus oophorus.
- The mature follicle appears to bulge from the surface, this mature follicle is termed Graafian follicle.
- Enlarged ruptured follicles contain lutein cells surrounding a blood clot and forms corpus luteum.
- Degenerated or atretic follicle shows disorganization of the follicular cells with the sign of nuclear necrosis as well as shrinkage or distortion of the central cell, i.e., the oocyte and/or its nucleus.

Hence, the specimen is a mammalian ovary.

Testis:



Identifying Characters:

The section showed the following characters:

- The lining epithelium of seminiferous tubules undergoes mitotic proliferation forming spermatogonia.
- Some of the spermatogonia persists as such along the inner surface of the basement membrane.
- Other spermatogonia move away from the basement membrane to the middle of the tubule and enlarge to form the primary spermatogonia.
- The nucleus of the P.S stains deeply with distinctive chromatin pattern.
- Inner to those P.S are secondary spermatocyte with half the intensity of staining of the nuclear chromatin.
- Nearer to the lumen are even smaller cells, the spermatids with spherical or elongated condensed nuclei.
- Sertoli cells are slender, pillar like cells with large pale staining nucleus which are separated from one another by densely crowded spermatogenic cells.

- The head of the maturing spermatozoa lies embedded within the apical cytoplasm of the Sertoli cells.
- Mature sperms are seen within the lumen of the seminiferous tubule with distinct head and long tail, the middle piece remaining obscure.

Hence, the specimen is a T.S of mammalian testis.