PANCREAS

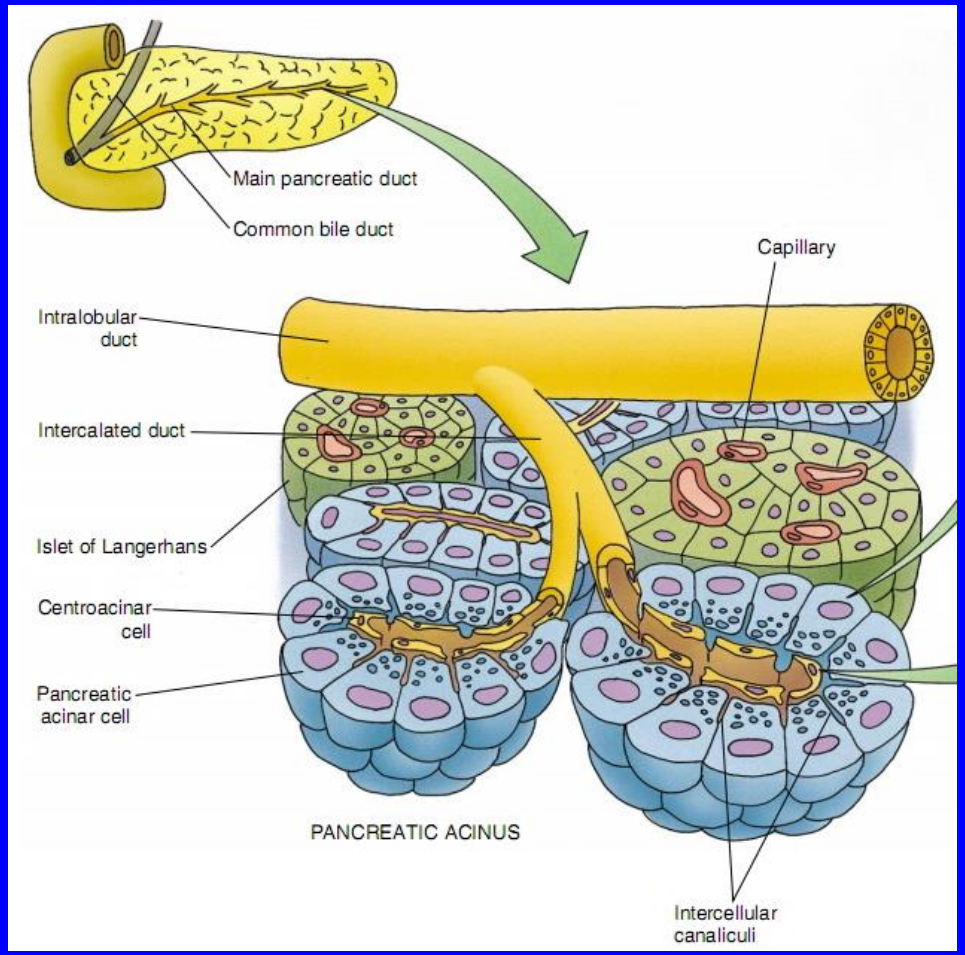
Objectives

The student should be able to describe:

1. The endocrine part of the pancreas within the exocrine part.
2. The histological features of the cells of islet of Langerhans.
3. The function of different cells of islets of Langerhans.

PANCREAS

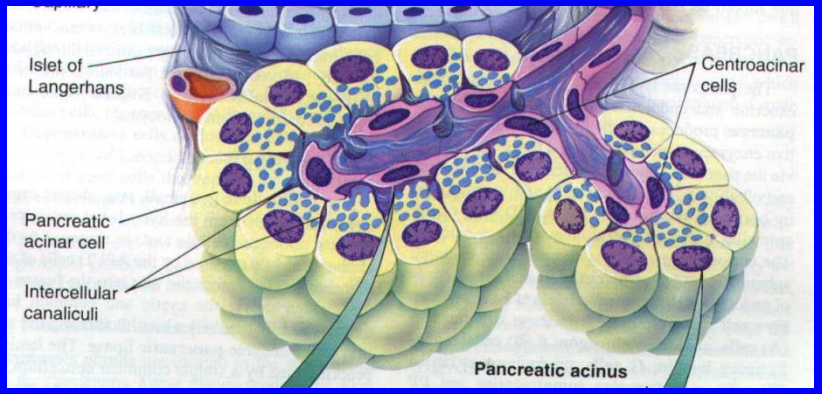
- **Stroma:** capsule, septa & reticular fibers.
- **Parenchyma:** Pancreas is a **mixed** gland:
  - **Exocrine part** (acini & ducts): produces digestive pancreatic enzymes.
  - **Endocrine part** (islets of Langerhans): produces hormones.

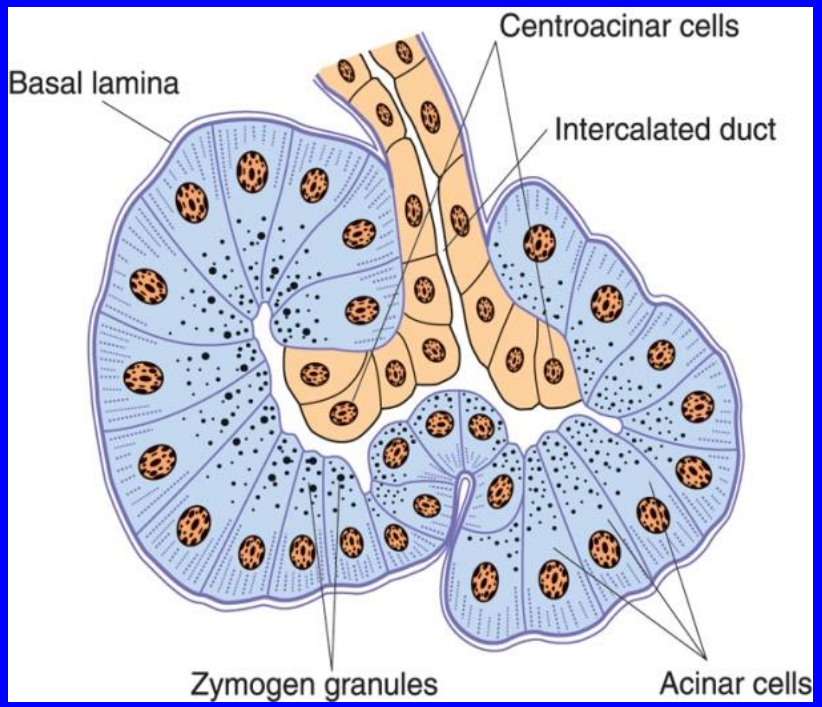


Exocrine Pancreas

Pancreatic Acini:

- They are serous acini: secreting a thin fluid rich in digestive pancreatic enzymes.
- Centroacinar cells: Their nuclei appear in the center of the acini. They represent the beginning of the ducts.
- No myoepithelial cells around the acini.

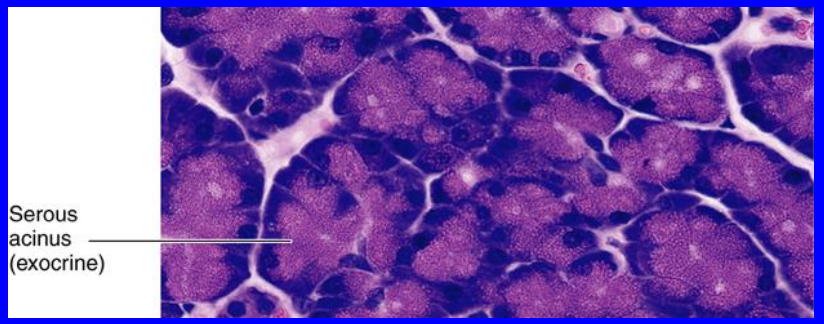


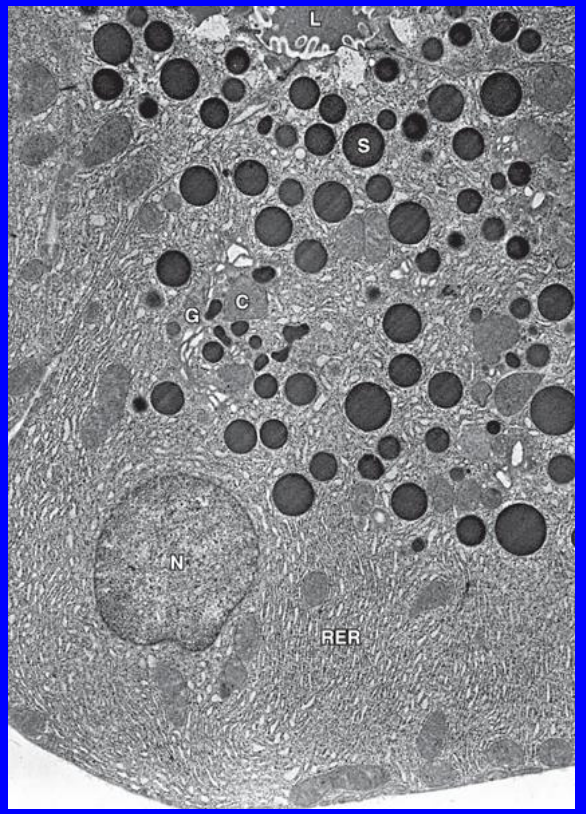


Exocrine Pancreas

Pancreatic Acinar Cells:

- Pyramidal in shape.
- Nuclei are basal.
- Cytoplasm:
  - Basal part basophilic (due to abundant rER).
  - Apical part acidophilic (due to secretory granules).

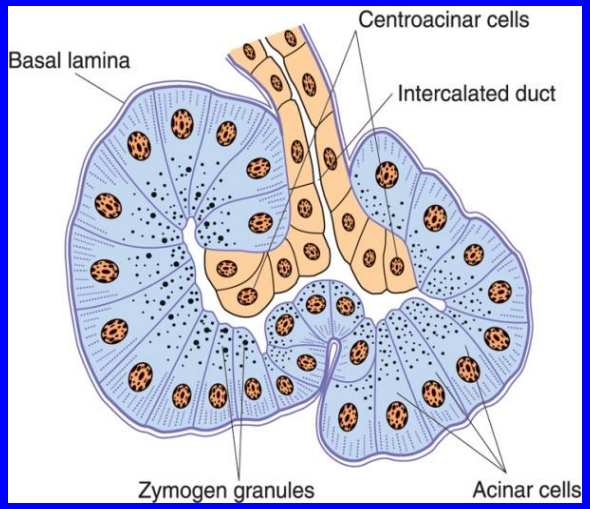


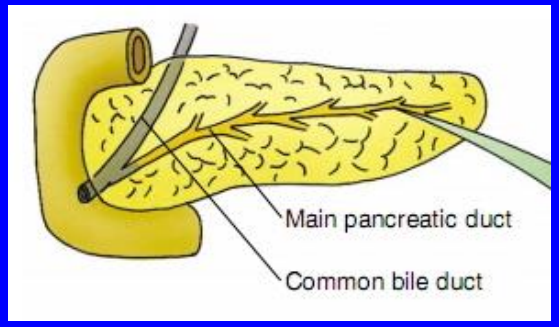


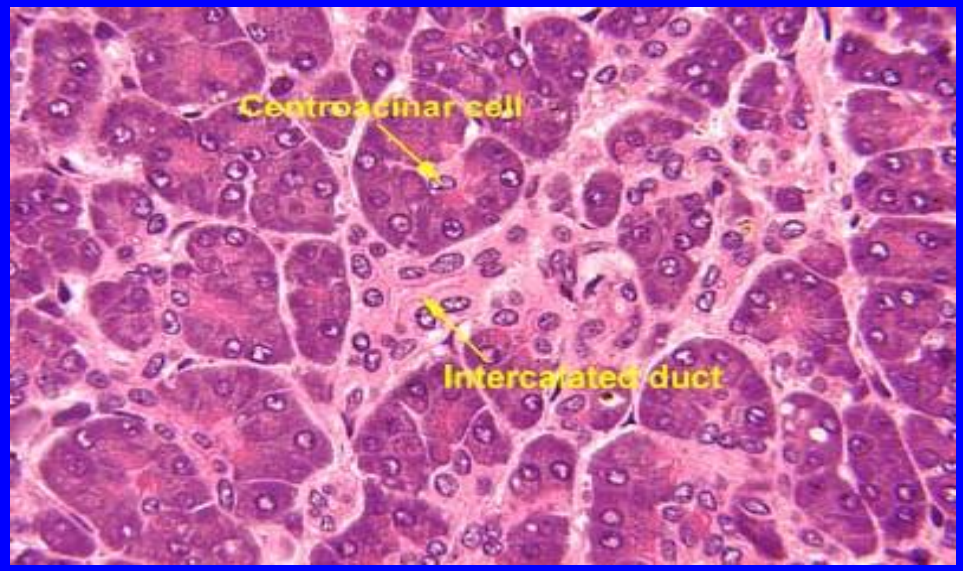
Exocrine Pancreas

Duct System:

- Centroacinar cells.
- Intercalated ducts (low cuboidal).
- Intralobular ducts (NOT prominent).
- Interlobular ducts.
- Main pancreatic duct.



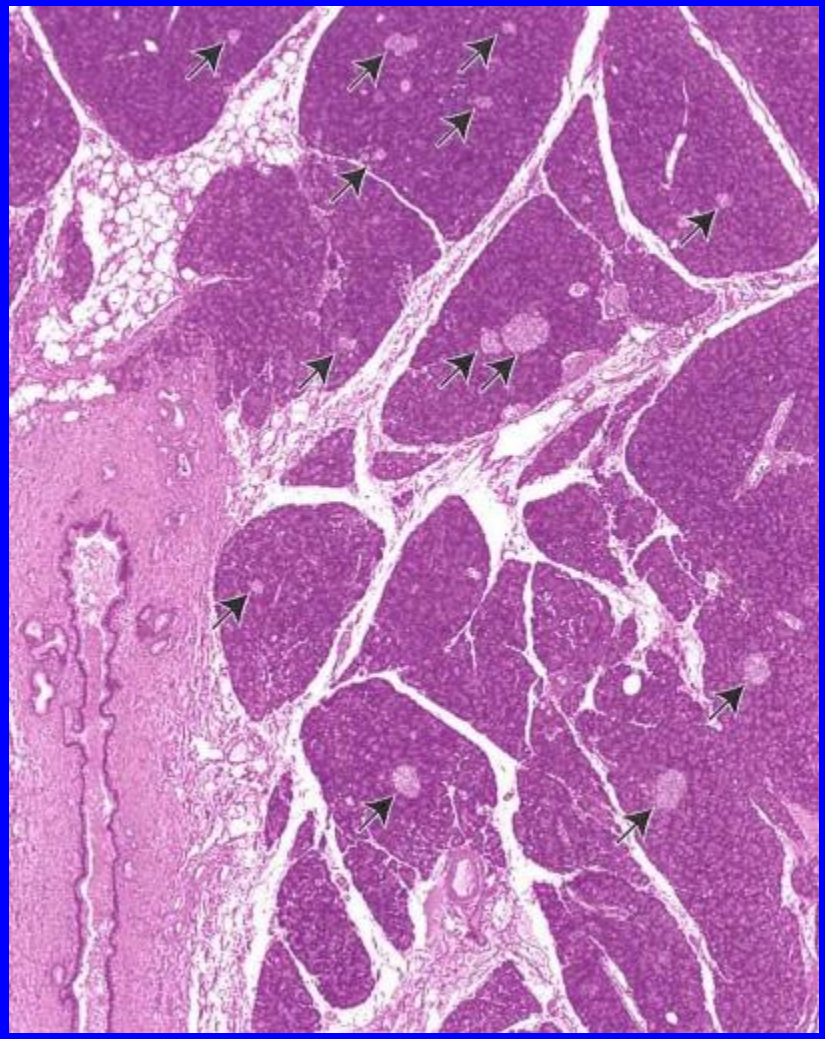




Endocrine Pancreas

Islets of Langerhans:

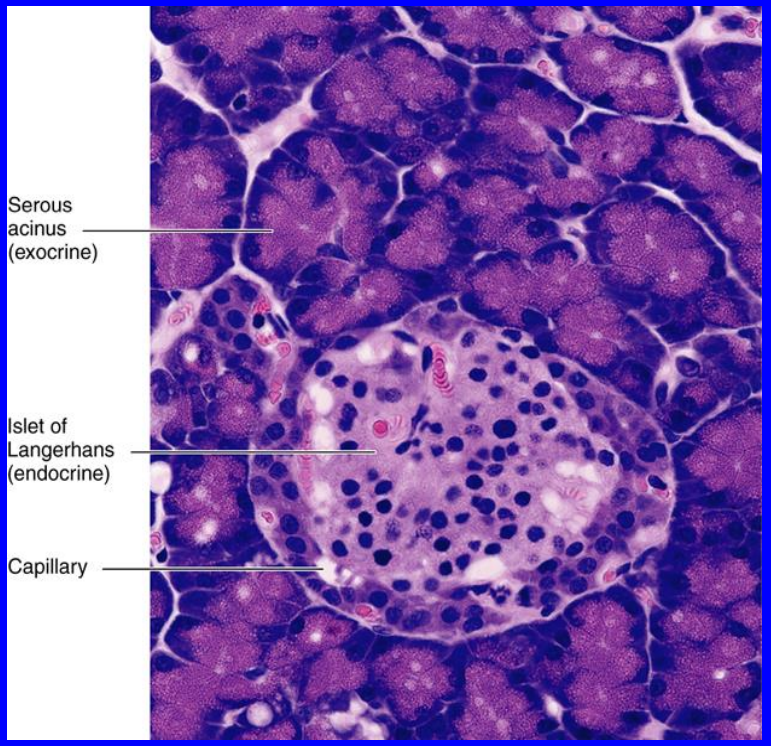
- Pale-staining spherical collections of endocrine cells, scattered among the acini.
- Richly vascularized by fenestrated capillaries.
- Each islet is surrounded and supported by reticular fibers.
- 1 million islets in human pancreas.
- Most numerous in the tail of pancreas.



Endocrine Pancreas

Cells of the Islets:

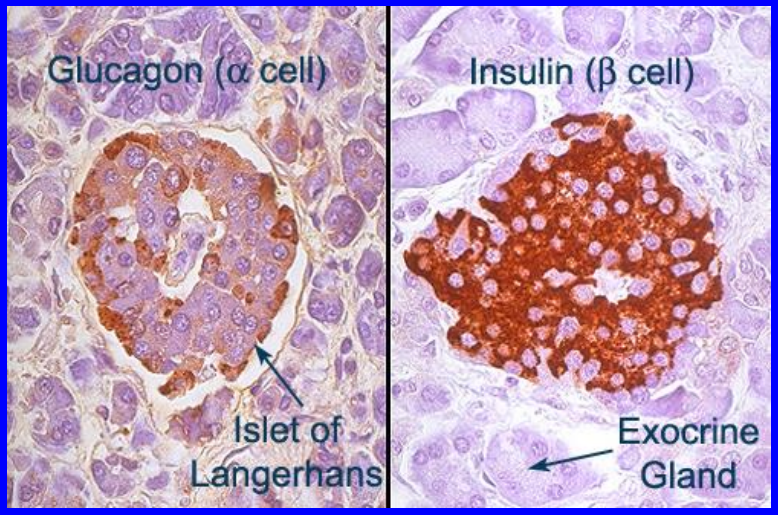
- 5 types of cells in each islet:
  1. **β (B) cells:** secrete insulin.
  2. **α (A) cells:** secrete glucagon.
  3. **δ (D) cells:** secrete somatostatin.
  4. **G cells:** secrete gastrin.
  5. **PP cells:** secrete pancreatic polypeptide.
- Cannot be differentiated from one another by routine stains.

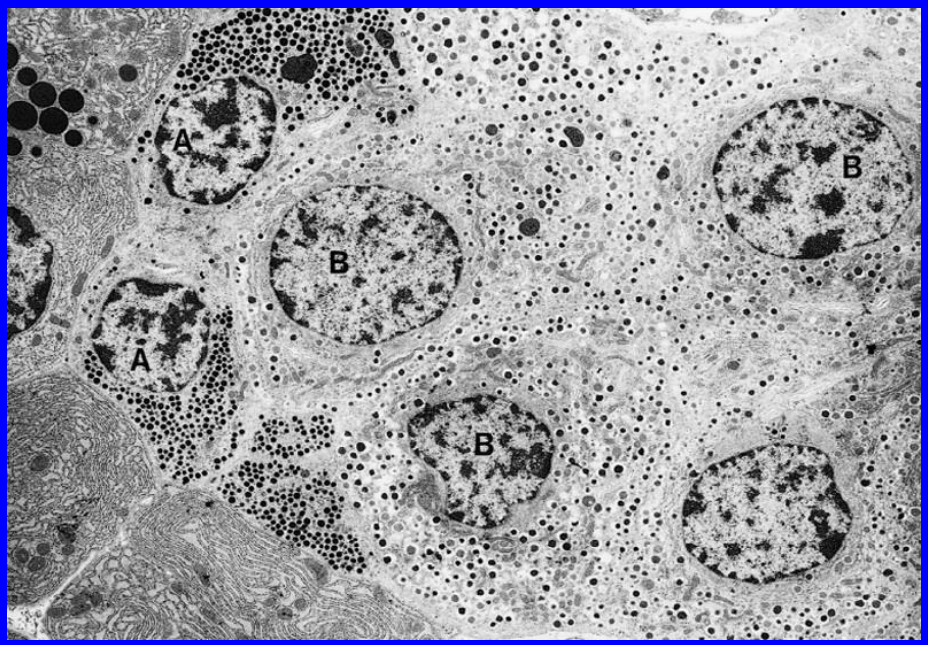


Endocrine Pancreas

Cells of the Islets:

- β (B) cells:
  - Constitute 70% of islet cells.
  - Concentrated in islet center.
  - Function: secrete insulin which ↓ blood sugar.
- α (A) cells:
  - Constitute 15-20%.
  - Concentrated in islet periphery.
  - Granules are much more numerous, more tightly packed, smaller, and denser than those of β cells.
  - Function: secrete glucagon which ↑ blood sugar.

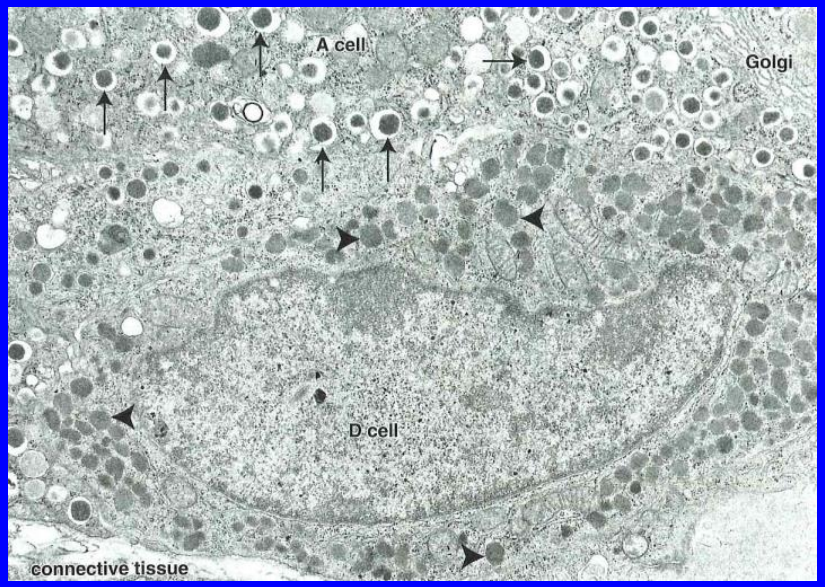




Endocrine Pancreas

Cells of the Islets:

- δ (D) cells:
  - Constitute 5-10% of islet cells.
  - Scattered throughout the islet.
  - Granules are less dense than those of β and α cells.
  - Function: secrete somatostatin which ↓ release of hormones from endocrine pancreas and enzymes from exocrine pancreas.



Endocrine Pancreas

Cells of the Islets:

- G cells:
  - Constitute 1% of islet cells.
  - Scattered throughout the islet.
  - Function: secrete gastrin which ↑ production of HCl by parietal cells of the stomach.
- PP cells:
  - Constitute 1% of islet cells.
  - Scattered throughout the islet.
  - Function: secrete pancreatic polypeptide which ↓ exocrine secretions of pancreas.

BEST WISHES