



LECTURE 5: PANCREAS

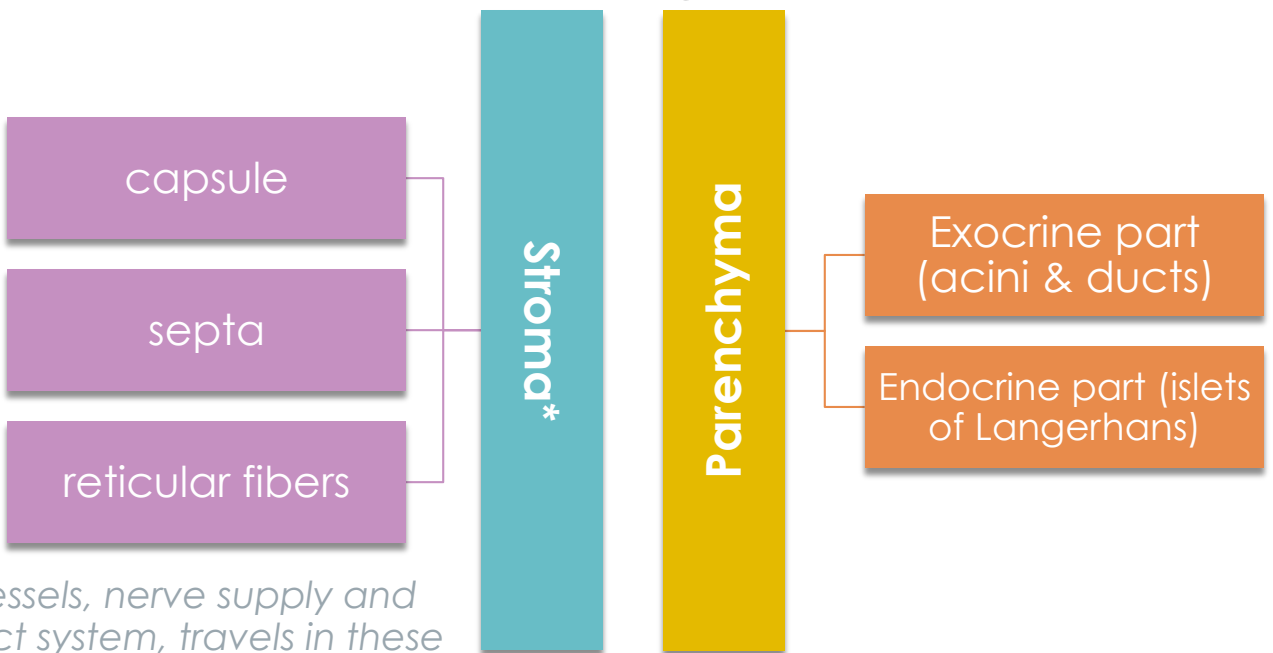
❑ Objectives:

Students 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

Pancreas is a **mixed** gland



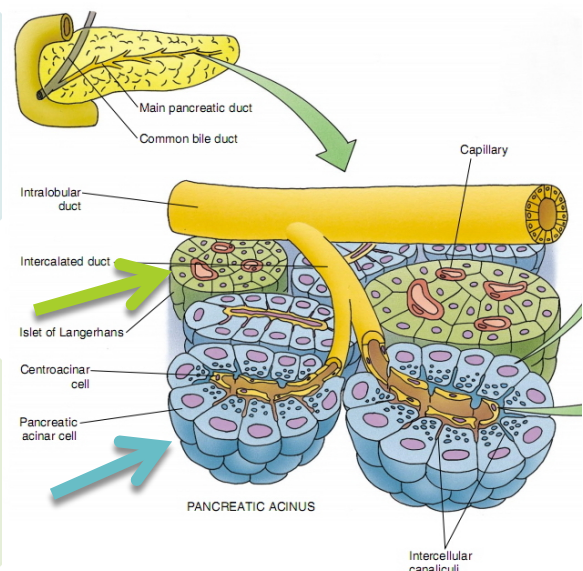
**Vessels, nerve supply and duct system, travels in these connective tissue septa.*

Exocrine part

- produces digestive pancreatic enzymes.

Endocrine part

- produces hormones



Exocrine Pancreas

Acini component:

serous acini

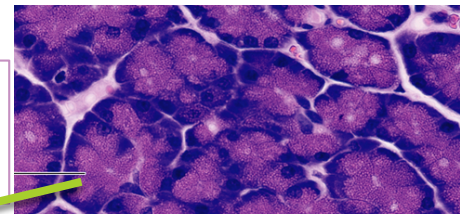
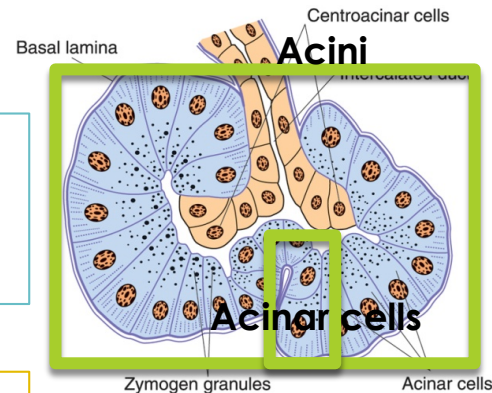
- secreting a thin fluid rich in digestive pancreatic enzymes.

Centroacinar cells

- Their nuclei appear in the center of the acini. They represent the beginning of the ducts.

No myoepithelial cells

- around the acini.



Pancreatic Acinar Cells

Pyramidal in shape.

Nuclei are basal.

Cytoplasm:

Basal part **b**asophilic = (due to **rER**).

Apical part **a**cidophilic = (due to **secretory granules**).

Duct System

Centroacinar cells.

Intercalated ducts (**low cuboidal**).

Intralobular ducts (**NOT prominent**).

Interlobular ducts.

Main pancreatic duct.

Endocrine Pancreas

Islets of Langerhans:

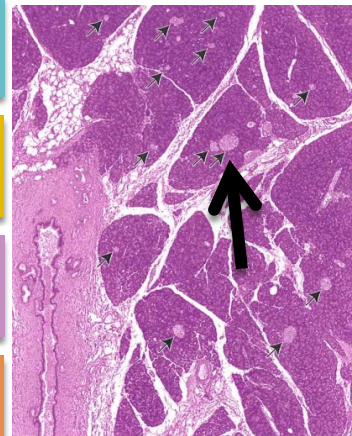
Pale-staining spherical collections of endocrine cells, scattered among the acini.

Richly **vascularized** by fenestrated capillaries.

Each islet is surrounded and supported by **reticular fibers**.

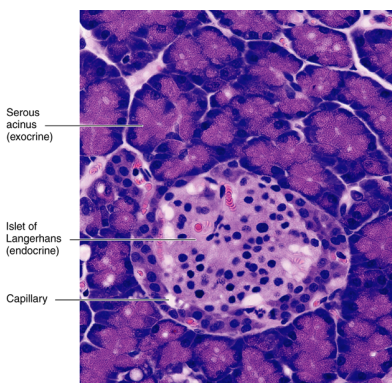
1 million islets in human **pancreas**.

Most numerous in the **tail** of pancreas.



Cells of the Islets:

5 types of cells in each islet



β (B) cells

- secrete insulin

α (A) cells

- secrete glucagon

δ (D) cells

- secrete somatostatin

G cells

- secrete gastrin

PP cells

- secrete pancreatic polypeptide.

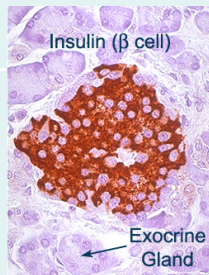
Cannot be differentiated from one another by routine stains.

β (B) cells

Constitute **70%** of islet cells.
Concentrated in islet **center**

Function

secrete insulin
which \downarrow blood
sugar.



picture

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 \uparrow blood sugar.



picture

δ (D) cells (inhibition)

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 \downarrow release of hormones
from endocrine pancreas and enzymes from exocrine
pancreas.

G cells

PP cells

Constitute **1%** of islet cells.
Scattered throughout the islet.

Function

secrete gastrin which
 \uparrow production of HCl
by **parietal** cells of
the stomach.

Function

secrete pancreatic
polypeptide which
 \downarrow exocrine
secretions of
pancreas.

MCQ's

1-**insulin** will be release to:

- A- increase blood glucose level
- B- decrease blood glucose level
- C-A+B

2- **glucagon** will be release to:

- A- increase blood glucose level
- B- decrease blood glucose level
- C-A+B

3-**somatostatin** will be release to:

- A- increase blood glucose level
- B- decrease blood glucose level
- C- decreases all enzymes secreted by pancreas

4- the **largest** part in the duct system is :

- A- Main pancreatic duct.
- B- accessory duct.
- C- Interlobular ducts.
- D- A+B