HISTOLOGY

Endocrine Block – 432 Histology Team

Lecture 5: Pancreas (Exocrine & Endocrine)

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Color Guide:

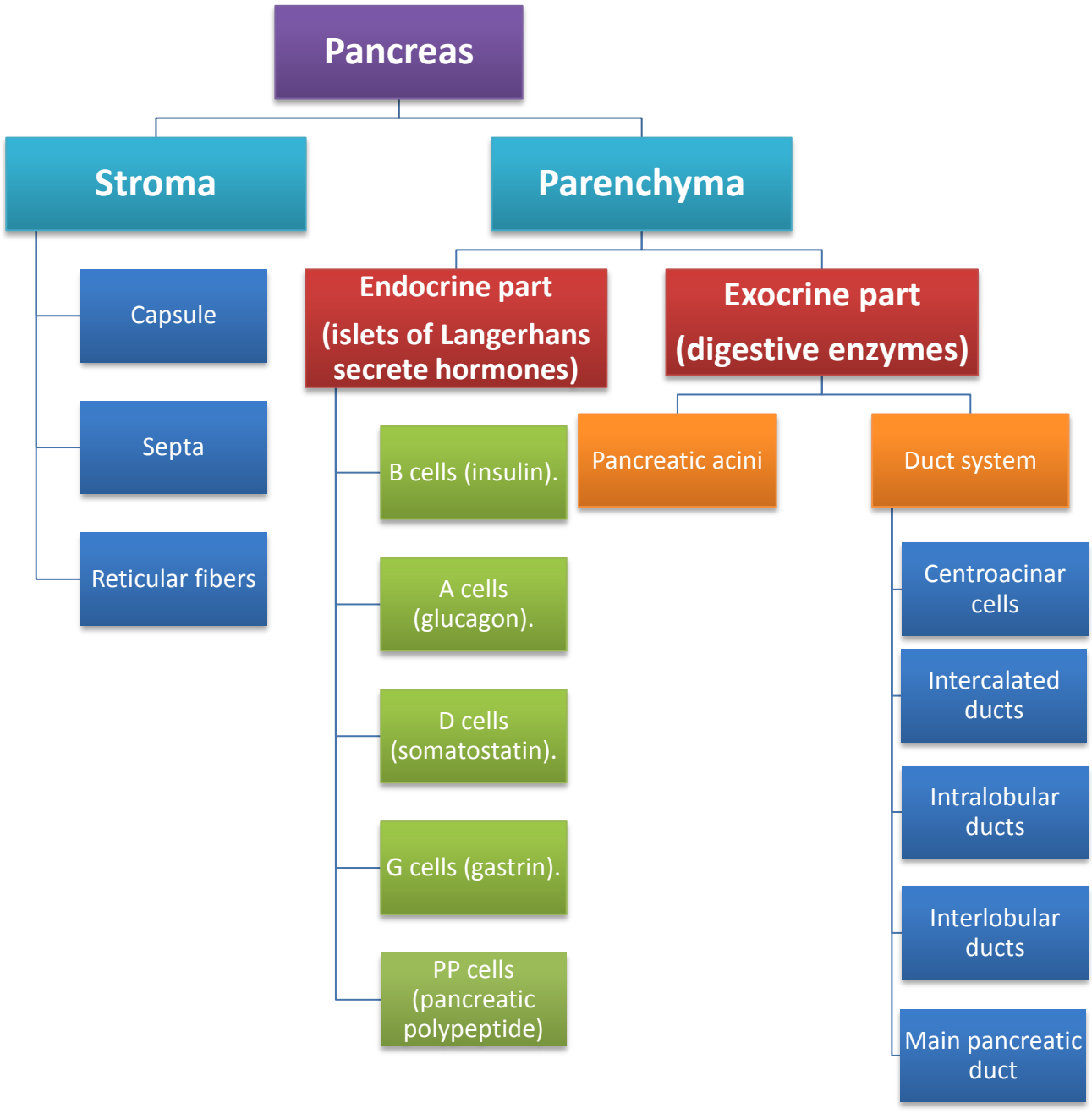
- **Black: Slides.**
- **Red: Important.**
- **Green: Doctor's notes (Female).**
- **Blue: Doctor's notes (Male).**
- **Orange: Explanation.**

Objectives

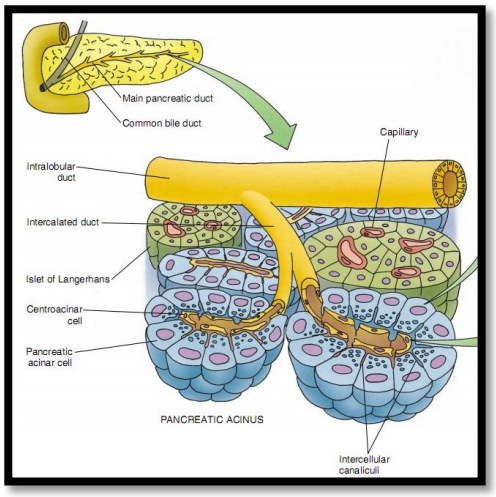
At the end of this lecture, you should describe the microscopic structure and the function of:

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.

Mind Map



Pancreas



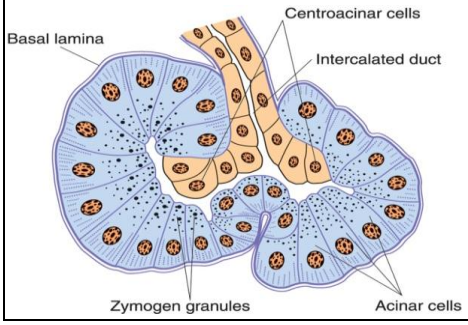
- **Stroma:** capsule, septa (trabecula); its thin connective tissue capsule forms septa, which subdivide the gland into lobules. The vascular and nerve supply of the pancreas, as well as its system of ducts, travels in these connective tissue septa & reticular fibers.
- **Parenchyma:** Pancreas is a **mixed** gland:

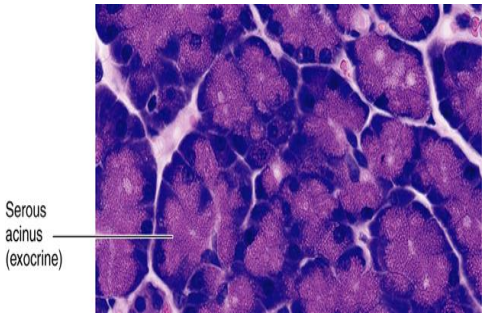
Exocrine part	Endocrine part
Acini & ducts	Islets of Langerhans
Produces digestive pancreatic enzymes.	Produces hormones.

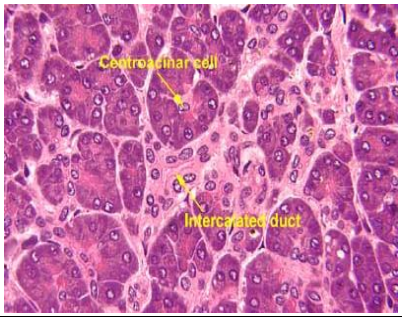
Exocrine Pancreas

Pancreatic Acini	Pancreatic Acinar Cells	Duct System
1. **They are serous acini**: secreting a thin fluid rich in digestive pancreatic enzymes. 2. **Centroacinar cells (acidophilic):** Their nuclei are in **center** of the acini. They represent the beginning of the ducts. 3. **No myoepithelial cells** around the acini.	• **Pyramidal** in shape. • Nuclei are basal. • Cytoplasm:	1. **Centroacinar cells.** 2. **Intercalated ducts:** (low cuboidal). 3. **Intralobular ducts:** (**NOT** prominent). 4. **Interlobular ducts:** (columnar epithelium). 5. **Main pancreatic duct.**

Apical part	Basal part
Acidophilic (due to secretory granules).	Basophilic (due to abundant rER & ribosomes).



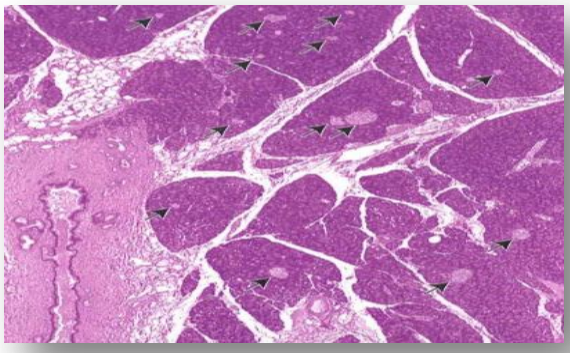


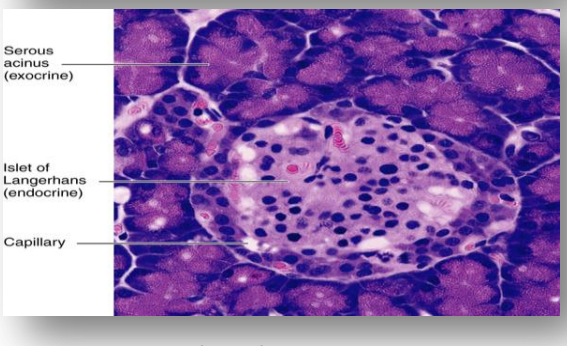


Endocrine part

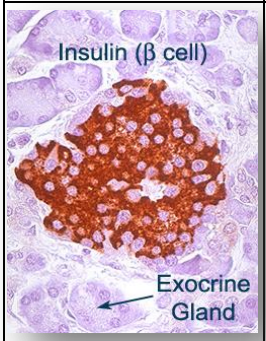
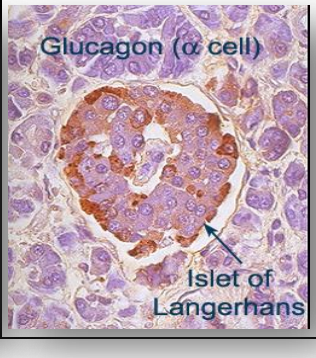
Islets of Langerhans

- 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.
- Most numerous in the tail of pancreas then the body.
- 1 million islets in human pancreas.



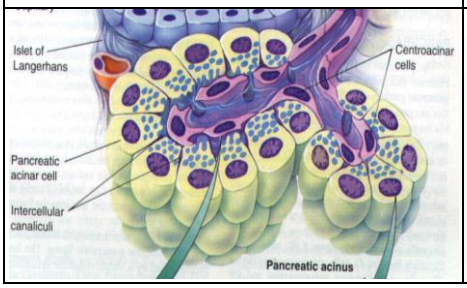
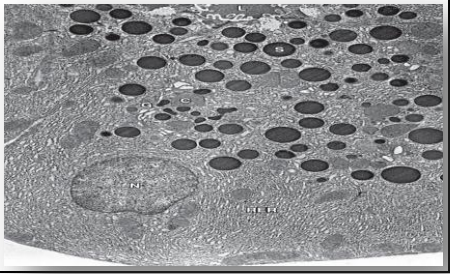
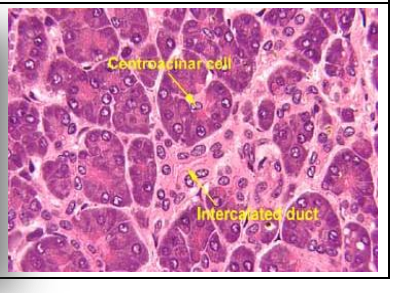


Cells of the Islets: Cannot be differentiated from one another by routine stains unless using immunohistochemistry.

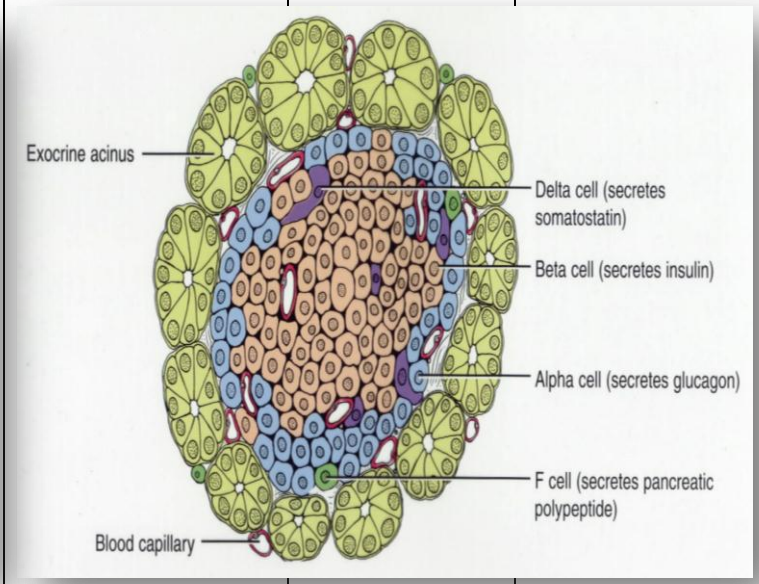
B	α	δ (D)	G	PP
Secrete **insulin** which ↓ blood sugar.	Secrete **glucagon** which ↑ blood sugar.	Secrete **somatostatin** which ↓ release of hormones from endocrine pancreas and enzymes from exocrine pancreas.	Secrete **gastrin** which ↑ production of HCl by parietal cells of the stomach.	Secrete **pancreatic polypeptide** which ↓ exocrine secretions of pancreas.
Constitute **70%** of islet cells.	Constitute **15-20%.**	**5-10%** of islet cells.	**1%** of islet cells.	
Concentrated in islet **center**.	Concentrated in islet **periphery**.	**Scattered** throughout the islet.		
–	Granules are much more **numerous**, more tightly **packed**, **smaller**, and **denser** than those of **β** cells.	Granules are **less dense** than those of β and α cells.	–	–
			–	–

Summary

Exocrine

Pancreatic Acini	Pancreatic Acinar Cells	Duct System
1. **Serous** acini. 2. **Centroacinar** cells. 3. **No** myoepithelial cells.	**1. Pyramidal** in shape. **2.** Nuclei are **basal**. **3.** Cytoplasm: **- Basal** part **basophilic**, **- Apical** part **acidophilic**.	1. **Centro**acinar cells. 2. Intercalated ducts 3. **Intra**lobular ducts 4. **Inter**lobular ducts. 5.Main pancreatic duct.
		

Endocrine

B	α	δ(D)	G	PP
secrete **insulin**	**Glucagon**	**Somatostatin**	**Gastrin**	**Pancreatic polypeptide**
Constitute **70%** of islet cells.	**15-20%**	**5-10%**	**1%**	
Concentrated in islet **center**.	In islet **periphery**.	**Scattered** throughout the islet.		
–	Granules are more **numerous**, **packed**, **smaller**, and **denser** than β cells.	**less dense** than β and α cells	–	–
				

Questions

Q1: which one of these Parenchyma produce hormones:

A. Acini.
B. Ductal epithelium.
C. Islets of Langerhans.
D. B cell.

Q2: Stroma consists of:

A. Intercalated ducts.
B. PP cells.
C. Interlobular ducts.
D. Reticular fibers.

Q3: Which cell produces gastrin:

A. G
B. β
C. α
D. D

Q4: The shape of the pancreatic acinar cells:

A. Rounded.
B. Pyramidal.
C. Cuboidal.
D. Columnar.

Q5: The most Constitute cells of islet cells:

A. α
B. PP
C. D
D. β

Answers

1	2	3	4	5
C	D	A	B	D

If you have any questions or suggestions please do not hesitate to contact us on:

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Best of luck!