

HUMAN PANCREAS: FUNCTIONAL ANATOMY & PHYSIOLOGY

1. ANATOMICAL DIVISIONS

- **LOCATION**Retroperitoneal, posterior to stomach
- **HEAD**Nestled in the C-loop of the duodenum
- **NECK**Thin section anterior to portal vein
- **BODY**Main horizontal mass crossing midline
- **TAIL**Tapered end reaching the splenic hilum
- **DUCTS**Wirsung (Main) & Santorini (Accessory)

2. ENDOCRINE FUNCTION (ISLETS OF LANGERHANS)

Cell Type	Hormone	Primary Action
Alpha (\hat{I}^{\pm})	Glucagon	Increases blood glucose via glycogenolysis
Beta (\hat{I}^2)	Insulin	Decreases blood glucose; cellular uptake
Delta (\hat{I}^1)	Somatostatin	Inhibits both insulin and glucagon release
PP (F) Cells	Pancreatic Polypeptide	Regulates exocrine secretion & appetite

3. EXOCRINE FUNCTION (ACINAR CELLS)

Enzyme Class	Specific Enzyme	Function
Proteases	Trypsinogen	Protein digestion (activated in duodenum)
Lipases	Steapsin	Breakdown of dietary triglycerides
Carbohydrases	Amylase	Hydrolysis of starch into sugars

Enzyme Class	Specific Enzyme	Function
Nucleases	Ribonuclease	Breakdown of nucleic acids

4. CLINICAL CONSIDERATIONS & PATHOLOGIES

Diabetes Mellitus

Type 1 (Insulin deficiency) vs Type 2 (Insulin resistance).

Pancreatitis

Autodigestion of tissue; Acute (often gallstones/alcohol) or Chronic.

Adenocarcinoma

Highly aggressive malignancy, typically originating in ductal cells.

Cystic Fibrosis

Thick mucus obstructing ducts, leading to malabsorption.