

## Endocrine Pancreas and Its Secretive Pathways

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### DESCRIPTION

In response to food intake, the exocrine pancreas secretes digestive enzymes, fluid, and bicarbonate. This is an important digestive process that is controlled by neural reflexes, gastrointestinal hormones, and nutrients absorbed. To ensure adequate digestion of a meal, secretion is highly regulated by both stimulatory and inhibitory influences that coordinate the delivery of digestive enzymes with food emptying into the intestine. Malnutrition and associated complications may result from mal-digestion and mal-absorption of nutrients in the absence of proper pancreatic secretion. Pancreatic secretion occurs in four distinct but overlapping phases, each named after the location of the ingested food. cephalic, gastric, intestinal, and absorbed nutrient are the four stages of pancreatic secretion. Within the phases, there is significant crosstalk and inter-regulation, ensuring adequate, but not excessive, enzyme and bicarbonate secretion. Each phase is governed by a complex network of neural, humoral, and paracrine feedback mechanisms that contribute to the maintenance of an optimal environment for food digestion and absorption. The exocrine pancreas secretes digestive enzymes, fluid, and bicarbonate ions to the duodenum. The pancreas is made up of both endocrine and exocrine cells [1].

The endocrine pancreas is made up of  $\alpha$ ,  $\beta$ ,  $\delta$ ,  $\epsilon$ , and PP (F) cells, which are found in the langerhans islets. These specialised cells secrete into the blood the hormones insulin, glucagon, somatostatin, ghrelin, amylin, and pancreatic polypeptide, which have endocrine and paracrine actions within the pancreas. Acinar cells make up 90% of the pancreas and secrete digestive enzymes like trypsin, chymotrypsin, and amylase to aid in food digestion in the small intestine. The acinar cells are triangular in shape and clustered, with the cell apex opening into a centrally located terminal duct. The terminal or intercalated ducts join together to form interlobular ducts, which then join together to form the main pancreatic duct. Exocrine secretions are delivered into the duodenum *via* the pancreatic duct. The ductal cells secrete fluid and bicarbonate ions, which neutralize both acinar cell secretions and the acidic gastric contents that enter the duodenum. The pancreas is densely packed with blood vessels that

regulate blood flow and modulate pancreatic secretion. It is heavily innervated by sympathetic and parasympathetic peripheral nerves. The secretory pathways are a highly regulated system that responds to ingestive signals and can be stimulatory or inhibitory in nature [2,3].

### Pancreastatin

Pancreastatin is produced by the cleavage of chromogranin A and is found in a variety of neuroendocrine tissues. It has been found in exocrine pancreatic duct cells, and one of its many functions is to inhibit pancreatic exocrine secretion. Pancreastatin inhibited postprandial fluid and protein secretion in rats with bile-pancreatic juice diversion. Basal secretion, secretin-stimulated secretion in conscious rats, and CCK-stimulated secretion from dispersed acini were all unaffected. Pancreastatin, on the other hand, inhibited CCK-stimulated pancreatic secretion in conscious rats while having no effect on plasma CCK levels. These findings imply that pancreastatin does not directly affect acinar cells, but rather regulates the intestinal phase of pancreatic secretion. Pancreastatin inhibited caerulein-induced blood flow in the exocrine pancreas, suggesting that its inhibitory effects stem from its role in regulating pancreatic blood flow [4].

### CONCLUSION

Pancreatic secretion is a complex process that begins with the sight and smell of food and continues until the food reaches the duodenum. This process is regulated by a variety of stimuli that affect neuronal and hormonal pathways at each level of food digestion. These pathways are both stimulatory and inhibitory, and they optimize enzyme, bicarbonate, and fluid release. Pancreatic exocrine secretion is a complex process that is mediated by neural and hormonal signals from the gut, as well as factors secreted by other tissues and hormones released from pancreatic islets.

### REFERENCES

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