

## PANCREAS

The pancreas is a gland with dual functions, it has both exocrine and endocrine secretions. Its exocrine secretions are important in digesting nutrients in the small intestine, and bicarbonate production (see Module 8: Digestive System) while its endocrine functions are important in regulating the process of those nutrients once they enter the blood. Most of the pancreas is devoted to producing digestive secretions but scattered throughout the gland are clusters of cells, the **pancreatic islets** (also known as the islets of Langerhans), that produce and secrete hormones. The most abundant cells of the islets are **beta cells** (70%) which secrete insulin. Another 20% of the islet cells, the **alpha cells**, secrete glucagon. These hormones play an essential role in regulating glucose levels in the blood. As you are aware, many cells in our bodies can make ATP from multiple nutrient sources, lipids being an important nutrient for skeletal and cardiac muscle cells. However, the cells of the nervous system are almost entirely dependent upon glucose as an energy source, therefore a sudden drop of glucose in the blood can have devastating effects on the nervous system. Insulin and glucagon work together to ensure that there are sufficient quantities of glucose for proper neuron function at all times. Insulin is the "food storage" hormone. When we have plenty of nutrients in the blood (times of feast, or right after a meal) insulin triggers storage of the excess in the form of glycogen and lipid for times when blood nutrient levels decline (famine). In these times of famine, like on fast Sunday or even between meals, glucagon mobilizes those stored nutrients to provide sufficient supplies for the tissues.

Insulin
Regulation of Secretion of Insulin
Glucagon
Diabetes Mellitus



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