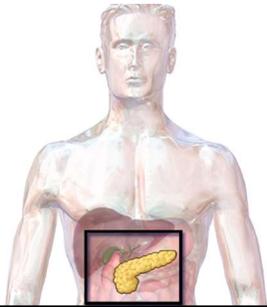
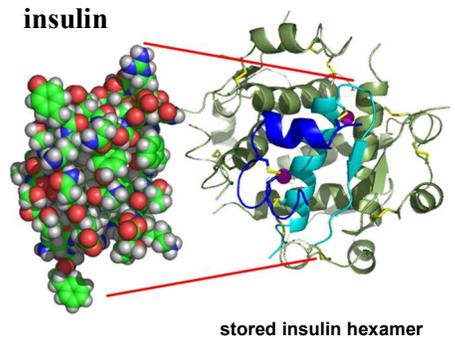
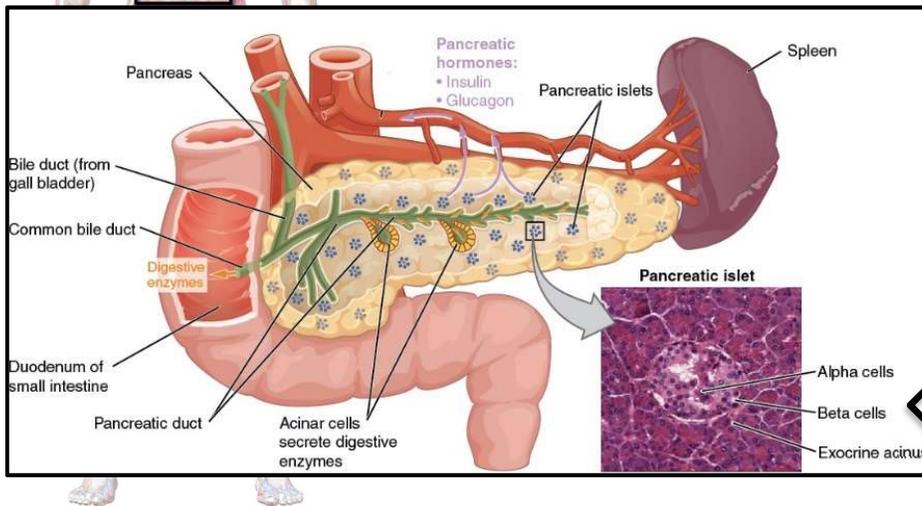


The Pancreas



The **pancreas** is an organ of the digestive system and endocrine (hormone regulating) system. In humans, it is located in the abdomen behind the stomach and functions as a gland, meaning its main role is to secrete digestive enzymes and other enzymes that help the body to function.

Shown below on the left is the active peptide (protein) hormone form of insulin that circulates in the blood. When stored inside the pancreatic beta cells, six of these molecules join together to form the “hexamer” shown at right. Red lines indicate the boundaries of the single molecule as positioned inside the larger hexamer.



The pancreas is located in the abdomen, right next to the stomach and acts as both a digestive gland and a hormone-producing regulatory gland.

Image modified from
https://commons.wikimedia.org/wiki/File:Blausen_0699_PancreasAnatomy2.png

Insulin monomer and hexamer,
<https://commons.wikimedia.org/wiki/File:InsulinMonomer.jpg>

Featured Protein: Insulin

Insulin, produced in the pancreas is the main blood hormone that helps to regulate blood sugar (the amount of glucose in the blood). Hormones are molecules that travel through the body as a kind of signal. Its main role is to help promote the transportation of glucose from the blood into cells that need the energy (for example your skeletal muscle cells). This function of getting glucose into cells is a critical step in cellular respiration, the process that allows us to turn food into energy. Cells in your pancreas are sensitive to glucose concentrations in your blood, also known as your blood sugar level...

When the glucose level in your blood is high, the pancreatic cells secrete insulin into the blood which then tells cells to start to take up the glucose. (Cells then use the glucose.) When glucose levels are low however, the cells must stop secreting insulin so that all of the glucose isn't taken in and used. When glucose levels are low, secretion of insulin is inhibited.

Insulin regulation is directly tied to most forms of diabetes, with type I diabetes resulting from a lack of glucose production by the beta cells. Interestingly, this is not due to a mutation in the gene that codes for insulin. Rather, it can occur because of a number of mutations that occur in other genes that somehow interact with the production of insulin inside the cell.