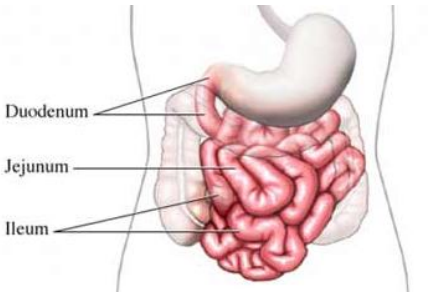
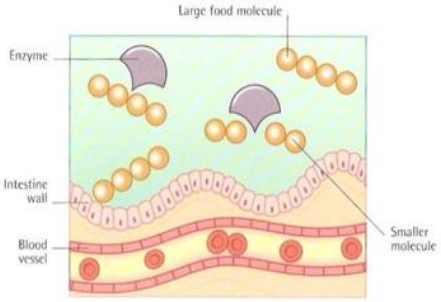
Digestion in the Small Intestine and the role of Accessory Organs

The small intestine is a coiled tube in the abdominal cavity about 7 meters long in adults. So names because of its small diameter, the small diameter consists of three parts in the following order:

1) Duodenum
2) Jejunum
3) Ileum



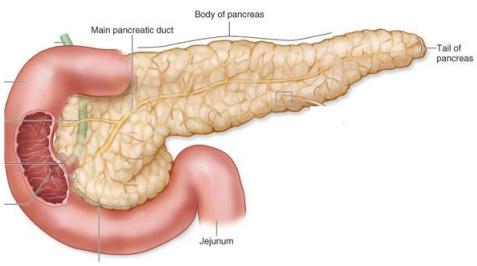


Inside the small intestine, macromolecules are broken into smaller molecules with the aid of enzymes, and are then transported to the bloodstream.

The digestion of food molecules inside the small intestine requires enzymes produced by two sources:

a. The **pancreas** and;
b. The lining of the small intestine itself.

The Pancreas



The **pancreas** is nestles in a loop formed by the first portion of the small intestine: the Duodenum.

Each day, approximately 1500 millilitres of pancreatic juices are secreted in the small intestine. This liquid is composed of:

i. Water
ii. Sodium bicarbonate, and
iii. Several important digestive enzymes.

The **sodium bicarbonate**, produced by the pancreas, has two main many functions:

a. Neutralizes the acidic chime by the stomach, thus protecting the small intestine.
b. Creates an environment optimal for the function of the pancreatic enzymes

The pancreatic enzymes act on large molecules in food. As a result of pancreatic enzymatic activity:

1) Fats are completely reduced to monoglycerides and fatty acids **(Lipase)**
2) Proteins are broken down into small peptide fragment and some amino acids **(Trypsin, erepsins)**
3) Carbohydrates are broken down into monosaccharides and disaccharides. **(Amylase)**

The Liver

The **liver** is one of the largest and most versatile organs in the body. This organ plays a key role in the digestion of fats through the production of a fluid called **bile**, which contains water, ions, and molecules such as cholesterol, fatty acids and bile salts. Bile salts emulsify fats, which means that they breakdown fat globule into smaller ones.

Produces by the cells of the liver, bile is first transported to the **gallbladder**, a sac attached to the underside of the liver. The gallbladder concentrated the bile by removing water from it. Bile is stored in the gallbladder until needed.