

## Functions of Liver and Pancreas in Human Digestion and Metabolism

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### DESCRIPTION

The liver and pancreas are two remarkable organs located in the abdominal cavity, playing crucial roles in digestion, metabolism, and overall well-being. While distinct in their functions, these organs work harmoniously to maintain the body's balance and health. In this article, we will explore the liver and pancreas in detail, highlighting their functions, importance, and common disorders.

#### Liver

The liver, the largest internal organ in the human body, is located on the right side of the abdomen, just beneath the diaphragm. Often referred to as the "chemical factory" of the body, the liver performs a wide range of vital functions, making it indispensable for overall health.

#### Metabolic functions

The liver is responsible for metabolizing carbohydrates, proteins, and fats. It converts excess glucose into glycogen, which is stored and released as needed to maintain blood sugar levels. Furthermore, the liver synthesizes essential proteins, such as albumin and clotting factors, ensuring proper blood clotting and maintaining osmotic balance.

#### Detoxification

One of the liver's primary roles is to detoxify harmful substances in the body. It processes drugs, alcohol, and toxins, breaking them down into less harmful forms and facilitating their elimination. This process, carried out by specialized liver cells called hepatocytes, helps protect the body from potential harm.

#### Bile production

The liver produces bile, a greenish-yellow fluid essential for fat digestion. Bile is stored in the gallbladder and released into the small intestine, where it helps emulsify fats, facilitating their breakdown and absorption. Without bile, our bodies would struggle to absorb essential fat-soluble vitamins.

#### Storage

The liver acts as a storage depot for various nutrients and vitamins.

It stores vitamins A, D, E, K, and B12, as well as iron and copper. These reserves are crucial for maintaining optimal health during periods of fasting or limited nutrient intake.

#### Common liver disorders

Despite its regenerative capacity, the liver is prone to various diseases. Some common liver disorders include:

**Hepatitis:** Inflammation of the liver, often caused by viral infections (hepatitis A, B, or C), alcohol abuse, or certain medications.

**Cirrhosis:** A progressive scarring of the liver due to long-term damage from alcohol abuse, chronic viral hepatitis, fatty liver disease, or autoimmune conditions.

**Fatty liver disease:** Accumulation of excessive fat in liver cells, often associated with obesity, diabetes, or excessive alcohol consumption.

**Liver cancer:** The development of cancerous cells within the liver, often associated with chronic liver diseases, hepatitis B or C infections, or alcohol abuse.

#### Pancreas

The pancreas, a long, flat gland located behind the stomach, is both an exocrine and endocrine gland. Its exocrine function involves the production of digestive enzymes, while its endocrine function involves the secretion of hormones regulating blood sugar levels.

#### Exocrine functions

The exocrine part of the pancreas consists of clusters of cells called acini, which produce and secrete digestive enzymes into the small intestine *via* a system of ducts. These enzymes, including amylase, lipase, and proteases, play a crucial role in breaking down carbohydrates, fats, and proteins, respectively, facilitating their absorption.

#### Endocrine functions

Scattered throughout the pancreas are small clusters of specialized cells called islets of Langerhans. These islets contain different types of cells, including alpha cells that produce glucagon and beta cells that produce insulin.

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