

Insulin is a hormone made in the pancreas by special cells called beta cells. Its main job is to lower blood sugar after eating by moving glucose out of the blood and into the body's cells. Without insulin, blood sugar would rise to unhealthy levels, which can damage the body over time. Insulin works as the partner of glucagon, keeping blood sugar balanced within a safe range.

When a person eats food, especially carbohydrates, glucose enters the bloodstream. The pancreas senses this rise and releases insulin. Insulin acts like a "key," unlocking the body's cells so glucose can move inside. Once inside the cells, glucose can be burned for energy or stored for later use, depending on the body's needs.

Besides lowering blood sugar, insulin also helps the body store energy. It tells the liver and muscles to store extra glucose as glycogen. It also signals fat cells to store fat. This ensures the body has fuel saved up for times when food is not available. In this way, insulin not only works in the moment but also helps prepare for the future.

If the body does not make enough insulin or cannot use it properly, blood sugar rises. This condition is called diabetes. In type 1 diabetes, the pancreas makes little to no insulin because the beta cells are destroyed. In type 2 diabetes, the body still makes insulin, but the cells don't respond well to it, a problem known as insulin resistance. Both types lead to high blood sugar if not managed.

High blood sugar over time can harm many parts of the body. It can damage blood vessels, nerves, kidneys, eyes, and even the heart. This is why keeping blood sugar balanced with the help of insulin is so important. Insulin therapy, such as insulin shots or pumps, allows people with diabetes to replace or supplement what their body cannot make.

On the other hand, too much insulin can cause blood sugar to drop too low, a condition called hypoglycemia. This can make a person shaky, sweaty, or confused. Severe hypoglycemia can even cause unconsciousness. That is why insulin use must be carefully balanced, especially in people with diabetes who take insulin as medicine.

Scientists and doctors continue to study insulin to improve diabetes care. Newer treatments include rapid-acting and long-acting insulin types, as well as insulin pumps and "artificial pancreas" devices that automatically adjust insulin levels. These advancements help people keep their blood sugar steadier and improve their quality of life.

In summary, insulin is a hormone that lowers blood sugar by moving glucose into the body's cells for energy or storage. It works closely with glucagon to keep energy balanced. Without insulin, blood sugar rises dangerously high, but with too much, it can fall too low. Understanding insulin is key to understanding how the body uses food for energy and why diabetes treatment is so important.