The body and brain use **glucose** as their primary energy source.
Cells break down **glucose** to create ATP (a molecule that cells use as energy).
**Glucose** travels through the bloodstream, and organs with glucose transporters on their cells take up **glucose**.
**Glucose** enters cells through glucose transporters.
Glucose Transporters

Glucose transporters allow glucose in the bloodstream to enter cells. When insulin is not present, glucose transporters sit inside of the cell waiting to be recruited to the cell membrane. When insulin binds to insulin receptors, it recruits glucose transporters to the cell membrane in order to take glucose from the blood into the cell. Glucose transporters are found in muscle and liver tissue.
The pancreas releases the hormone **glucagon** when blood glucose levels are low. **Glucagon** binds to its target tissues through specific receptors. **Glucagon** binds to receptors on its target cells, such as muscle and liver cells.
Glucagon receptors are expressed on glucagon’s target cells, such as liver and muscle cells. Once glucagon binds to a glucagon receptor, the receptors initiate a response inside the cell. One of these responses is to break down glycogen into glucose.
Insulin

The pancreas releases the hormone **insulin** when blood glucose levels are high. **Insulin** binds to its target tissues through specific receptors. **Insulin** binds to receptors on its target cells, such as muscle and liver cells.
Insulin receptors

Target cells of insulin, such as liver and muscle cells, have **insulin receptors**. Once insulin binds to an **insulin receptors**, the receptors initiate a response inside the cell. One of these responses is to bring extra glucose transporters to the cell membrane. Another response is that the **insulin receptors** initiate is to encourage the storage of glucose as glycogen inside the cell.
Glucose is stored inside cells as glycogen, a molecule made up of hundreds to thousands of glucose molecules. Insulin signaling initiates glycogen storage in cells. Glucagon signaling breaks down glycogen in cells. The liver has the ability to store glycogen for the whole body and can store a lot of it—10x more than muscles!