- Insulin- The Islets of Langerhans in the pancreas secrete insulin when the blood glucose concentration increases above normal levels. Insulin promotes the utilization of glucose by the cells.
    - Normal Secretion- It decreases blood glucose concentration by increasing the permeability of cell membranes to glucose which will increase the rate of glucose uptake by the cells. It also stimulates the liver and muscle cells to convert glucose into glycogen for storage and it increases the oxidation of glucose during tissue respiration. These help to decrease blood glucose concentration.
    - Lack of secretion- Glucose cannot be stored or utilized by tissue cells, so blood glucose concentration rises. Some glucose is subsequently lost in the urine, giving rise to diabetes mellitus. Since muscle cells have no reserves of glycogen, the body grows weak and continuously loses weight. The body oxidizes fats instead of glucose to produce energy. This results in the production of poisonous substances called ketones which are excreted in urine.
    - Over-secretion- Abnormal decrease in blood glucose concentration. Low blood glucose concentration results in a condition called shock. Coma and death may follow.
- Glucagon- The Islets of Langerhans increases the secretion of the hormone glucagon when the concentration of blood glucose decreases below normal levels. The main target of glucagon is the liver. Glucagon increases blood concentration by stimulating the conversion of glycogen, fats and amino acids into glucose.
- Adrenaline- The adrenal medulla secretes the hormone adrenaline when one feels afraid, angry, anxious or stressed. Adrenaline prepares the body for states of emergency. The responses that arise from the secretion of adrenaline are temporary as adrenaline is a short-lived hormone. When stimuli activate the hypothalamus in the brain, there is a transmission of impulses down the spinal cord. The motor neuron transmits impulses to the adrenal gland at the kidney. The adrenal gland secretes adrenaline into the bloodstream. Blood transports adrenaline to the target organs via the blood vessels.
    - Effects of Adrenaline-
        - Convert glycogen to glucose so that more glucose is available for muscle concentration.
        - Increase the blood glucose level and the metabolism rate, producing more energy during respiration.
        - The rate of heartbeat increases and causes a rise in blood pressure to pump oxygen and glucose to the muscles faster to support the increased metabolism rate.
        - The rate of ventilation will increase to increase oxygen intake.
        - The blood clotting rate will increase.
        - The arterioles to the gut will constrict, decreasing digestive activities.