

Glucagon



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Glucagon

- Glucagon is also called the hyperglycemic hormone
- Most of the Actions of Glucagon Are Achieved by Activation of Adenylyl Cyclase in hepatic cell membrane
- The binding of glucagon to hepatic receptors results in activation of adenylyl cyclase and generation of the second messenger cyclic AMP, which in turn activates protein kinase, leading to phosphorylation that results in the activation or deactivation of a number of enzymes.

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Effects on Glucose Metabolism

- Glucagon Promotes Hyperglycemia
- Greatly enhance the availability of glucose to the organs of the body
- **Glucagon stimulates glycogenolysis:**
- Glucagon has immediate and pronounced effects on the liver to increase glycogenolysis and the release of glucose into the blood.
- This effect is achieved through activation of liver phosphorylase and simultaneous inhibition of glycogen synthase.

- **Glucagon stimulates gluconeogenesis:**
- Glucagon increases the hepatic extraction of amino acids from the plasma and increases the activities of key gluconeogenic enzymes.
- Consequently, glucagon has delayed actions to promote glucose output by the liver.

Other Effects of Glucagon

- Occurs only when its concentration rises well above the maximum normally found in the blood.
- Activates adipose cell lipase, making increased quantities of fatty acids available to the energy systems of the body.
- Glucagon also inhibits the storage of triglycerides in the liver, which prevents the liver from removing fatty acids from the blood.
- Enhances the strength of the heart
- Increases blood flow in some tissues, especially the kidneys
- Enhances bile secretion
- Inhibits gastric acid secretion.

Regulation of Glucagon Secretion

- Increased Blood Glucose Inhibits Glucagon Secretion
- Increased Blood Amino Acids Stimulate Glucagon Secretion
- Exercise Stimulates Glucagon Secretion
- Somatostatin Inhibits Glucagon and Insulin Secretion

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