Glycogen metabolism

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Function of glycogen

Glycogen is the **storage form of carbohydrates** in the human body.

- **The major sites of storage are liver and muscle.**

1. The major function of **liver glycogen** is to provide glucose during starvation.

- **When blood glucose level lowers,** liver glycogen is broken down and helps to maintain blood glucose level.

2. The function of **muscle glycogen** is to act as reserve fuel for muscle contraction.

- Muscle glycogen is depleted after prolonged exercise.

Glycogen metabolism

- After taking food, blood sugar tends to rise, which causes glycogen deposition in liver. About 5 hours after taking food, the blood sugar tends to fall. But, glycogen is lyzed to glucose so that the energy needs are met.
- After about 18 hours fasting, most of the liver glycogen is depleted, when depot fats are hydrolyzed and energy requirement is met by fatty acid oxidation.

Glycogen metabolism

Glycogen metabolism includes:

- **Glycogenolysis.**
- **Glycogenesis.**

Glycogen metabolism

Glycogenolysis

It is intracellular breakdown of glycogen to form

G-1-P which is converted to G-6-P.

Site and steps:

Its main site is the cytosol of liver and muscles.

It is catalyzed by: *glycogen phosphorylase* and two other enzymes.

Glycogen metabolism

1- Glycogen phosphorylase:

- The enzyme glycogen phosphorylase removes glucose units one at a time from the non-reducing end of the glycogen molecule.
- The product is glucose-1-phosphate.
- Phosphorylase sequentially attacks alpha-1,4 glycosidic linkages, till it reaches a branch point.
- It cannot attack the 1,6 linkage at branch point.