GLYCOGENOLYSIS

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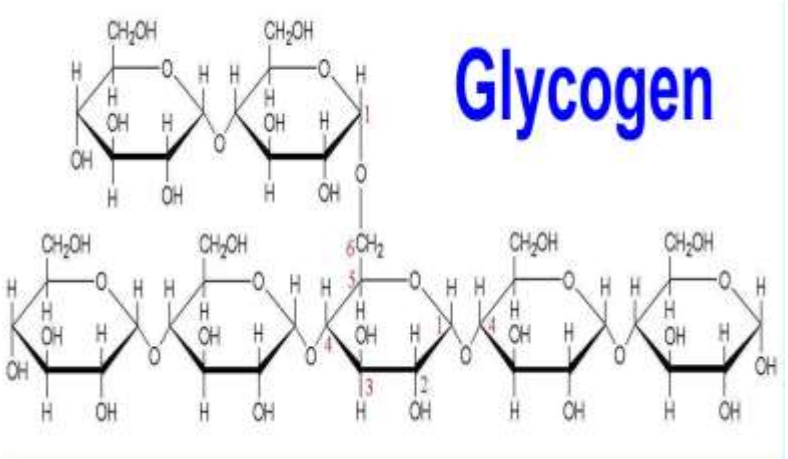
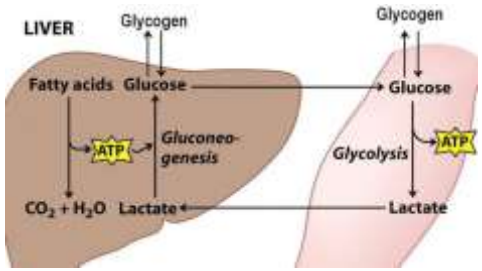
Glycogen

Multibranched subunit of glucose.
Serve as a form of energy storage in humans, animals, fungi etc.
consist of 2 types of linkages, alfa(1→ 4)linear linkage alfa(1→ 6) branching linkage.



Storage

Storage form of glucose in animals (animal starch).
Granular form , high in liver (6-8%) and muscles(1-2%).



Glycogenolysis

Breakdown of glycogen to glucose 1 phosphate and glucose in liver and muscles.
To meet the immediate energy demands of the body or when the blood glucose level is low.

Steps involved in glycogenolysis.

Step-1 action 0f glycogen phosphorylase.

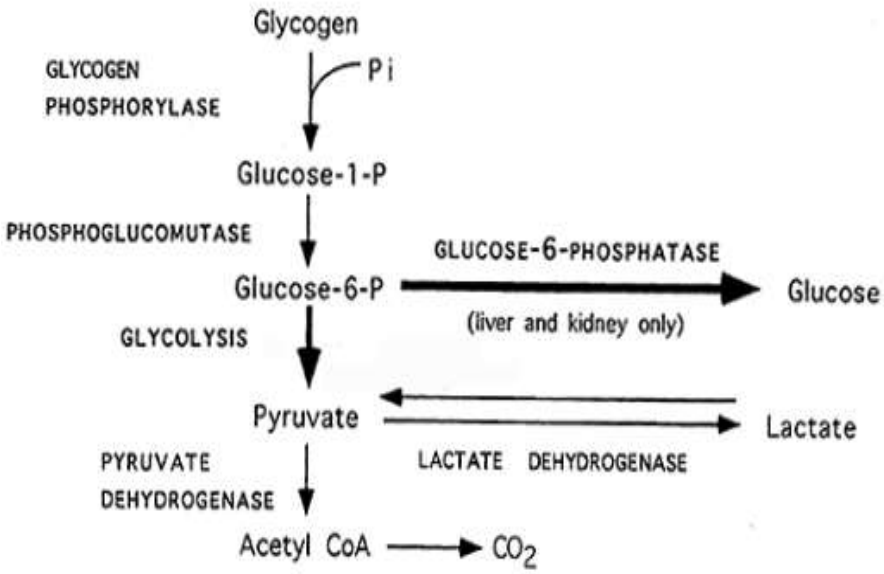
Alpha-1,4-glycsidic bonds(from non-reducing ends)are cleaved sequentially by enzyme **glycogen phosphorylase** to yield

Gluc-1-phosphate .

This proses is called **phosphorolysis.**

Limits : degrades the glycogen molecules until 4 glucose residues remain on each chin before a branch point (stops at 4 glucose residue

The glycogen so formed is known as limit dextrin which can not be further degraded by phosphorylase.



Step-2 action of debranching enzyme

The branch of glycogen are cleaved by **debranching enzyme**(bifunctional enzyme) .

1. Glycosyl 4:4 transferase (oligo alpha 1,4→1,4 glucan transferase)
Activity removes a fragment of 3 or 4 glucose residues from a branch and transfer them to another chain.

2.Amylo alpha-1,6-glucosidase

Breaks the alpha-1,6-bond at the branch with a single glucose residue.

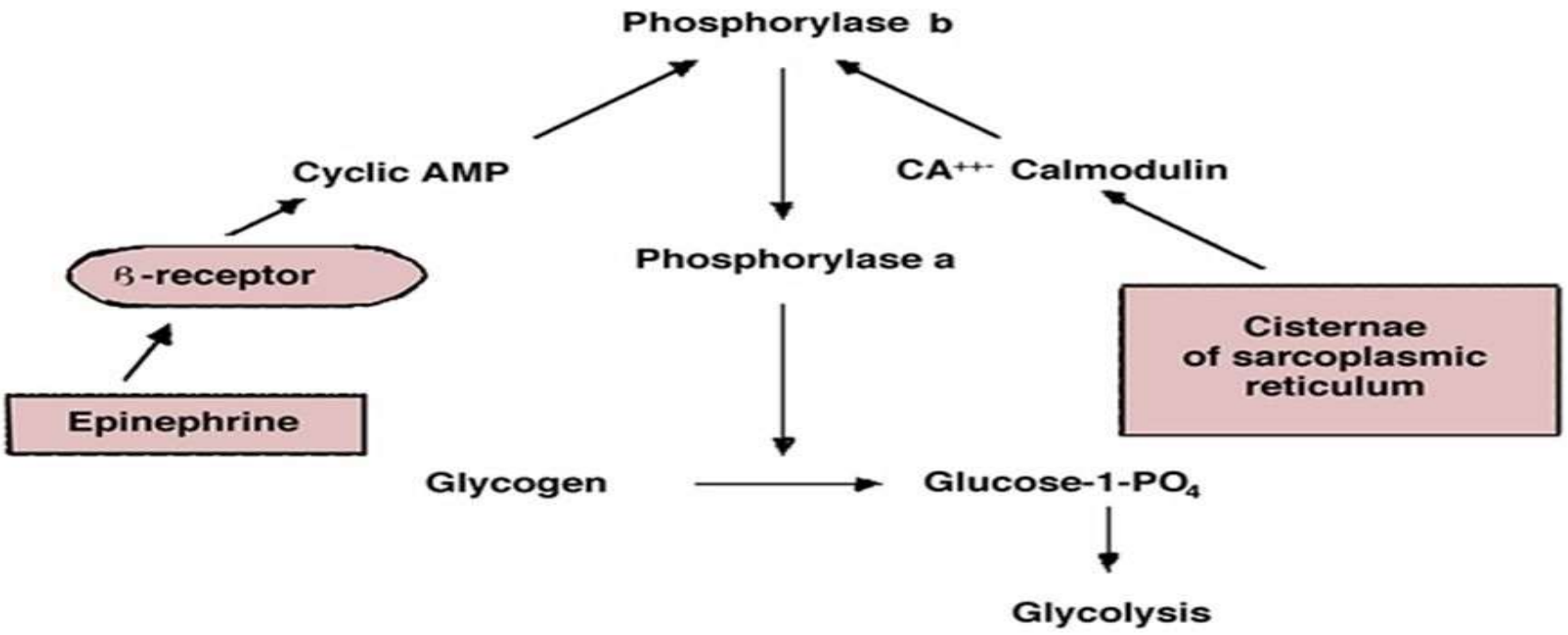
Step-3 Formation of glucose -6-phosphate and glucose

Combined action of glycogen phosphorylase and branching enzyme free glucose(8:1 ratio) are produced .

Glucose- 1-phosphate is converted to glucose-6-phosphate by the enzyme **phosphoglucomutase.**

In liver, kidney, and intestine **Glu-6-p** is converted in to glucose.

Control of Glycogenolysis



THANK YOU