

**GLYCOGENESIS, GLYCOGEN
STORAGE DISEASES,
GLUCONEOGENESIS, CORI
CYCLE, HMP SHUNT,**

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GLYCOGENESIS

Process of converting glucose to glycogen

glucose

↓ (glucokinase, hexokinase)

glucose-6-phosphate

↓ (phosphoglucomutase)

glucose-1-phosphate



uridine di phosphate glucose(UDPG)

end of first step, then processing of primer

glycogen primer



(glycogen synthase)

1,4- glycosidic linkage



(glycosyl,alp-4-6 transferase)

alp-1-6 bond



GLYCOGEN

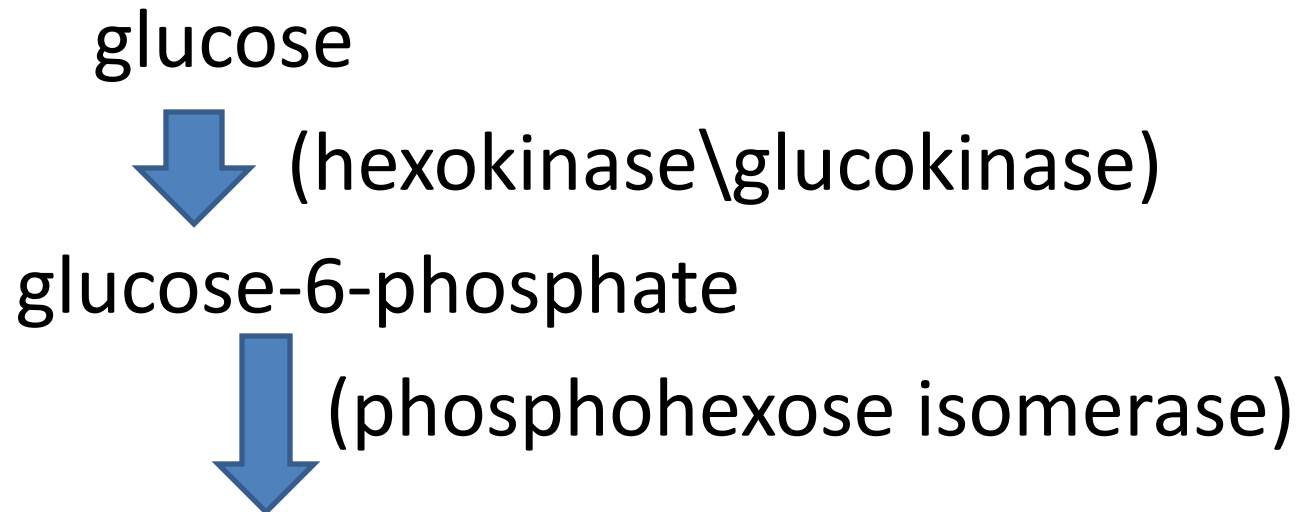
GLYCOGEN STORAGE DISEASE

- Von Gierke's disease-def. glucose -6-po4
-glycogen accum in
hepatocytes and renal cells
- Pomper's disease-def. alph-1,4,glucosides
-HF
- Cori's disease- def. amylo alpha-1,6-
glucosidase, symptoms similar to Gierk's
disease

- Anderson's disease- def of Glucose 4,6 transferase, cirrhosis of liver, impairment of liver function
- Mc Ardle's disease- def glycogen phosphorylase(muscle)
- Her's disease- def glycogen phosphorylase(liver)
- Taru's disease-phosphofructokinase

GLYCOGENEogenesis

- That is glucose is produced from non-carbohydrate compounds.(lactate, pyruvate, glucogenic amino acid, propionate and glycerol)
- Reverse of glycolysis, except three reactions



fructose-6-phosphate



(phosphofructokinase)

fructose-1,6-bisphosphate



splits into



Dihydroxyacetone

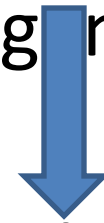
glyceraldehyde-3

-phosphate

(phosphotriose isomerase)

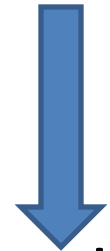


(glyceraldehyde-3-phosphatedehydrogenase)



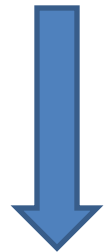
1,3-biphosphoglycerate

(phosphoglycerate kinase)



3-phosphoglycerate

(phosphoglycerate mutase)



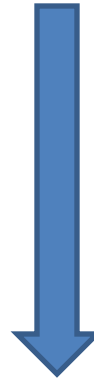
2-phosphoglycerate

(enolase)



phosphoenolpyruvate

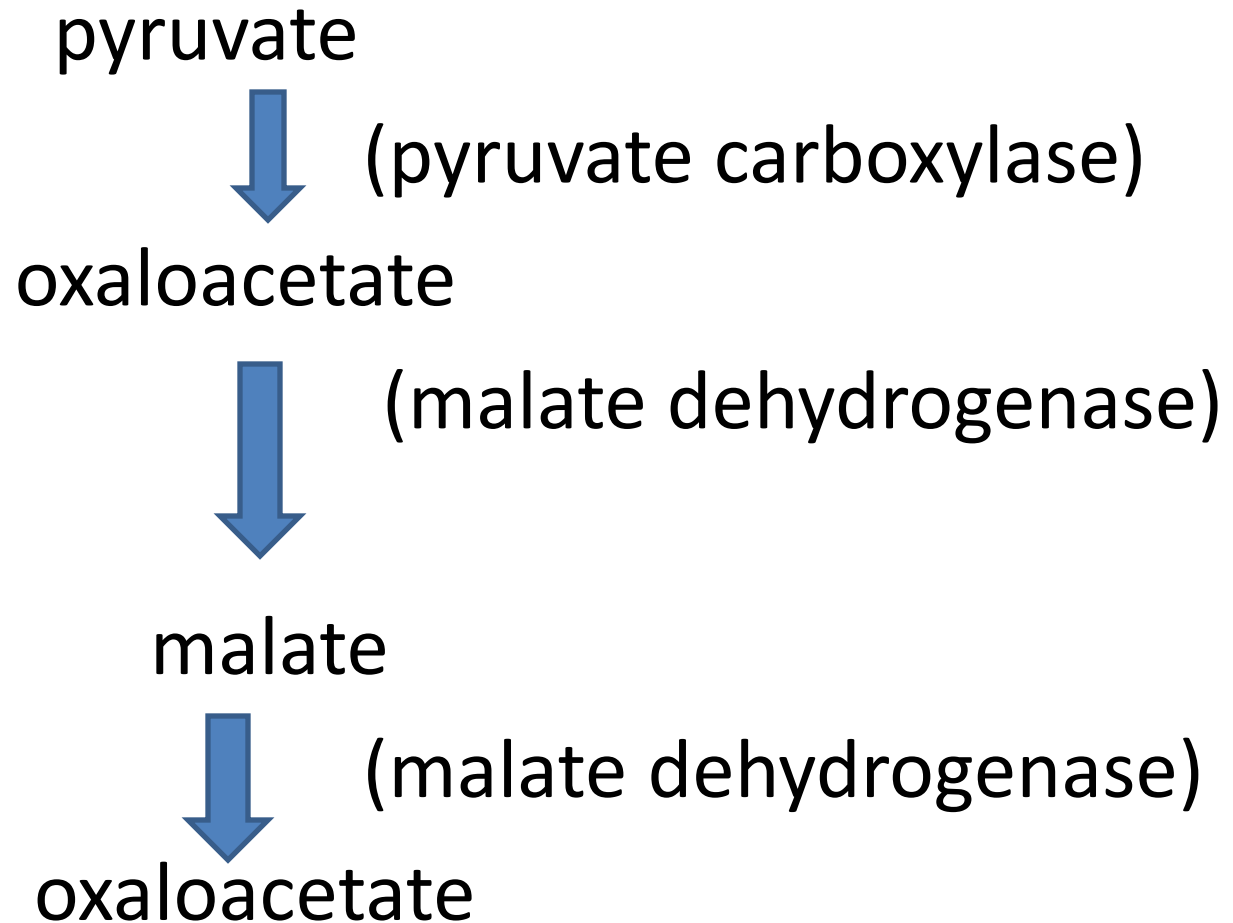
(pyruvate kinase)



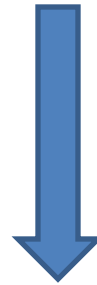
pyruvate

Three irreversible steps

➤ Pyruvate to phosphoenolpyruvate



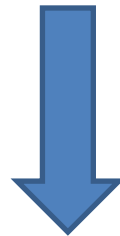
(phosphoenolpyruvate
carboxylkinase)



phosphoenol pyruvate

➤ Fructose-1,6-biphosphate to fruc-6-phosphate

Fructose-1,6-biphosphate

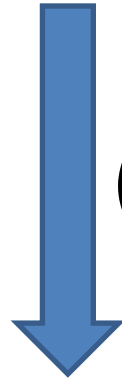


(fructose1,6-biphosphatase)

fructose-6- phosphate

➤ Glucose -6-phosphate to glucose

Glucose -6-phosphate



(glucose-6-phosphatase)

glucose

CORI CYCLE

- It is gluconeogenesis from lactate

HEXOSE MONOPHOSPHATE SHUNT

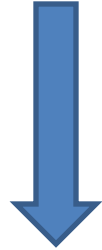
- Also called pentose phosphate pathway or phosphogluconate pathway
- it's an alternative pathway to glycolysis and TCA cycle for oxidation of glucose.

Reactions of this pathway

- in two phase- oxidative
 - non-oxidative

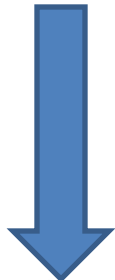
oxidative

glucose -6-phosphate



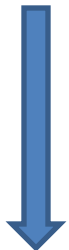
(gluc-6 -phosphate dehydr
ogenate)

6-phosphogluconate

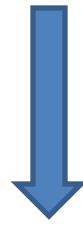


(6-phosphogluconate dehy
drogenate)

3keto, 6- phosphogluconate



(decarboxylation)



ribulose-5-phosphate

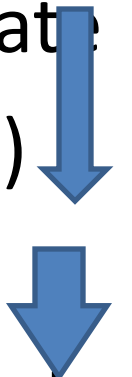


(an epimerase)



Xylulose-5-phosphate

(ribose-5-phosphate
ketoisomerase)



ribose-5-phosphate

(transketolase)



Sedoheptulose-7-phosphate

glyceraldeh
yde-3-phosohate

(transaldolase)



Erythrose-4-phosphate
↓ (transketolase)

fructose-6-phosphate
↓

Glyceraldehyde-3-phosphate fructose-6-phosphat

These compounds through GLYCOLYSIS and CITRIC ACID CYCLE , lead to the production of glucose.

THANK YOU