

# Regulation of Glycogenesis

\* 2 main enzymes will be regulated in this process :-

Glycogen synthase

remove P  
make it active

• Stimulated by :

Glu-6-P ~ since it indicate high blood Glu level

Insulin

• Inhibited by :

Protein kinase A

adding P  
make it Active.

Glycogen phosphorylase

→ degrade Glycogen.

• inhibited by,

Insulin

Glu-6-P ~ already I have good Glu level in blood, I don't need more.

ATP ~ I don't need Glycolysis to happen.

Glucose (liver only) ~ I don't need more.

• Stimulated by,

ATP (muscle only) ~ I need Glu to make more ATP to muscle contraction.

In Addition, enzyme will be regulated by another enzyme Phosphorylase Kinase. 2 forms



Protein kinase A

→ is not selective  
So it phosphorilate both enzyme  
(Phosphoglycose)  
(synthase)

→ adding P  
make it inactive

Insulin (↑ Glucose).

tyrosine kinase receptor

this kinase receptor will activate protein phosphatase (PP1)

it's not (selective) So it remove phosphate from Both (Phosphoglycose)

remove P make it active (synthase)

remove P convert to inactive

CAMP → 5' AMP

protein kinase A → CAMP ciliates

degradation

protein kinase A

Glycogen degradation

↓ phosphodiesterase

↓ degradation

NE EPI: Glucagon (↓ Glu)

It will bind to GTP

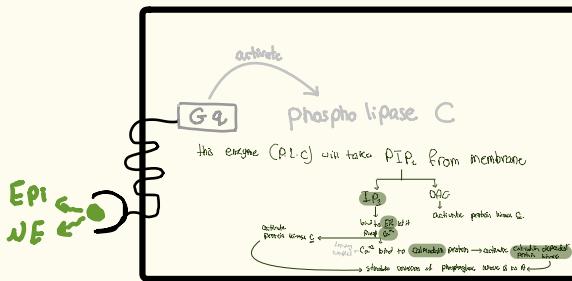
and become Active

→ Adenyl cyclase → cAMP

→ Protein kinase A → adding P

to phosphoglycose kinase B turning it to phosphoglycose kinase A → adding P

+ Glycogen phosphorylase



\* Glucagon / Epinephrine → نفخ الشكل

\* Acetyl-CoA (أسيتيل كوليد) و Fat (فاط) يتحول إلى Glucose (أجل)!

لكن Fat مستحصل يعود لـLipoprotein (أيبروپروتين) (Acetyl CoA)

{قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلِمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ}