

## Session 8

Metabolism = Linked set biochemical reactions by which we obtain and use free energy ( $\Delta G$ ) for life

see metabolic chart

Use  $\Delta G$  for:

1. Mechanical work
2. Generate [gradients] (e.g., of ions)
3. Biosynthesis

A

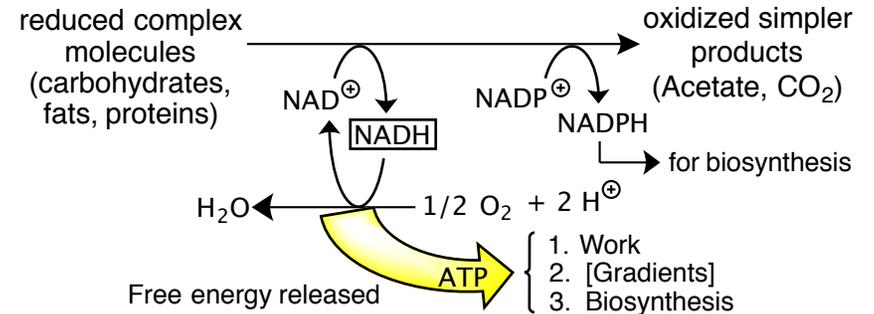
## Metabolism divided into:

1. Catabolism ( $\Delta G < 0$ )  
- energy yielding pathways
2. Anabolism ( $\Delta G > 0$ )  
- consumption of energy and reducing equivalents to finance biosynthesis

ATP  
NADPH

B

## Catabolism Paradigm



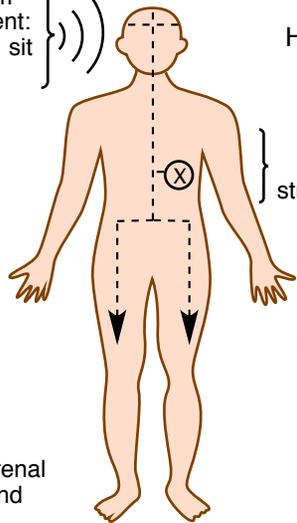
C

1

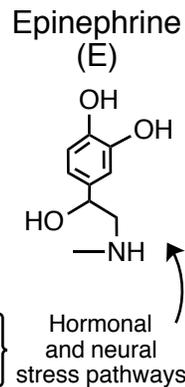
## Physiological Scenario

The professor tells a student to stand up and then sit back down. What happens in the student's body?

Signal from Environment: "Stand up, sit down"



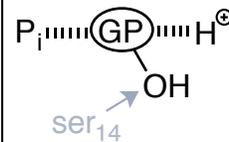
⊗ = Adrenal gland



Stand up, sit down

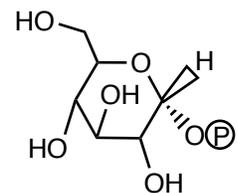
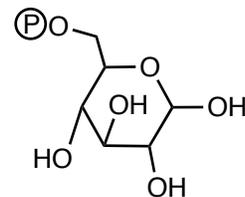
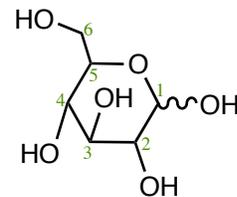
D

## Biochemical Players

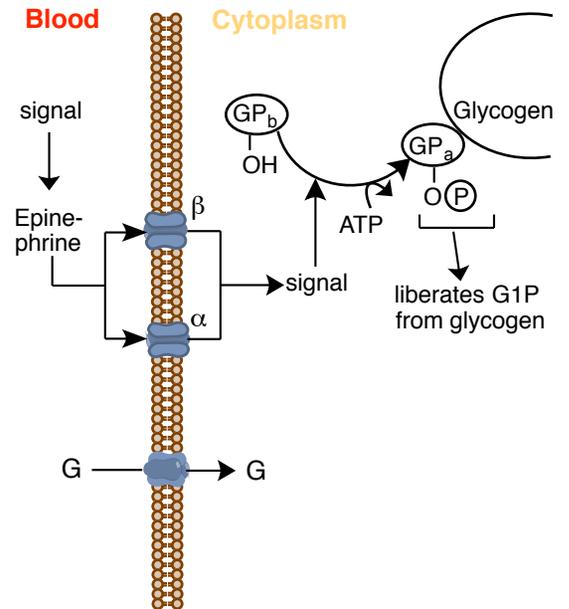


### Glycogen Phosphorylase

GP $\alpha$  = active (Serine<sub>14</sub> Phosphorylated)  
GP $\beta$  = inactive  
P<sub>i</sub> = inorganic phosphate



E



Signal ("stand up, sit down") causes epinephrine release that, in turn, causes the activation of GP, which liberates G1P for metabolism.

F

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