CONCEPT: NEGATIVE FEEDBACK

●Negative feedback (feedback _____) is an *efficient* & _____ means for biochemical *regulation*.

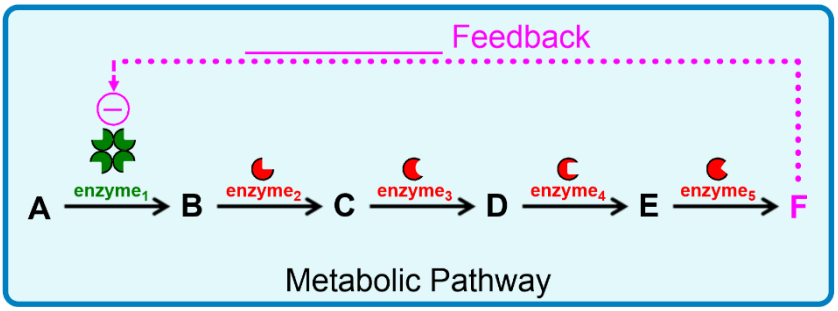
□ Prevents the _____ & wasteful production of a product (**P**).

●*Negative feedback inhibition*: final product of a metabolic pathway _____ an *earlier* step in the *same* pathway.

□ This _____-_____ the entire metabolic pathway & begins to *lower* final [**P**].

□ Negative feedback _____ (**-**) bind to an _____ site on the *allosteric* enzyme (_____ the active site).

EXAMPLE: Negative Feedback acts like the "red light" to inhibit (**-**) metabolic pathways.



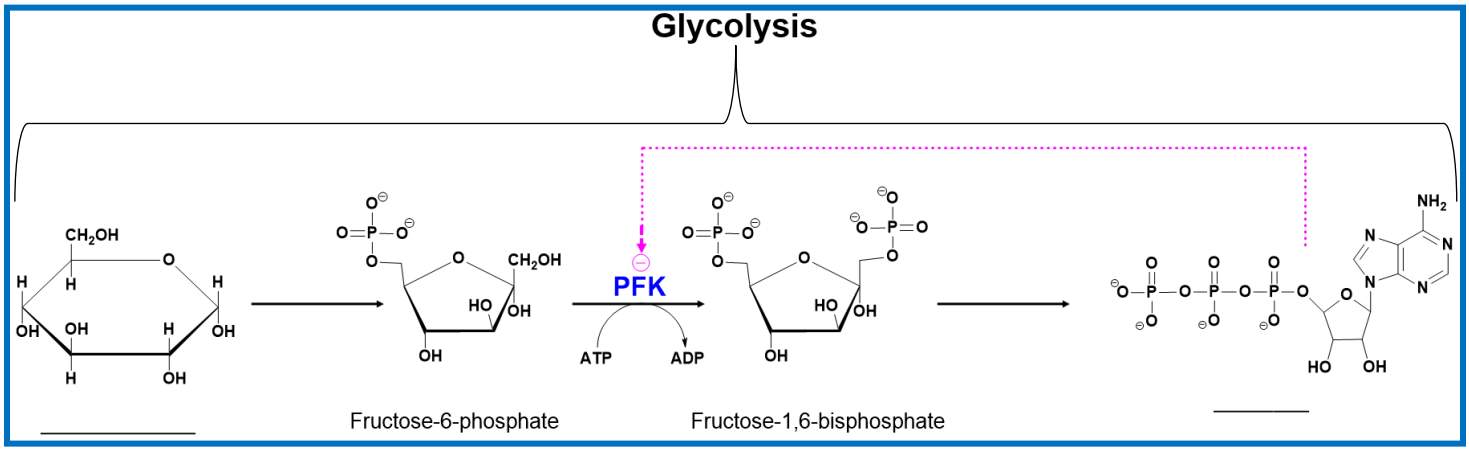
●When final [**P**] is returned to _____ levels, feedback inhibition stops & metabolic pathway proceeds.

EXAMPLE: Feedback Regulation in Glycolysis.

●Recall: _____ is a process in cellular respiration that breaks down *glucose* to generate *energy* (ex. ATP).

□ Phosphofructokinase (_____) is an allosteric enzyme that catalyzes a reaction step in glycolysis.

□ PFK is regulated via *negative feedback* by ATP acting as a _____ allosteric effector.



PRACTICE: The scheme below represents a hypothetical metabolic pathway for the synthesis of compound Y. The pathway is regulated by feedback inhibition. If S → T is the rate-limiting step, circle what the most likely inhibitor is and indicate with an arrow where the inhibition most likely occurs:

S → T → U → V → W → X → Y

CONCEPT: NEGATIVE FEEDBACK

PRACTICE: A metabolic pathway proceeds according to the following scheme: R → S → T → U → V → W. A regulatory enzyme, X, catalyzes the first reaction in the pathway. Which of the following is most likely correct for this pathway?

a) Either U or V is likely to be a positive regulator to increase the activity of X.
b) The first product, S, is likely a negative regulator of X, leading to feedback inhibition.
c) The last product, W, is likely a negative regulator of X, leading to feedback inhibition.
d) The last product, W, is likely a positive regulator of X, leading to feedback inhibition.

PRACTICE: Which of the following is TRUE about feedback inhibition?

a) Feedback inhibition has no physiological importance.
b) Sometimes multiple products are required for feedback inhibition.
c) Feedback inhibition can only be accomplished by products from the same pathway by which they are formed.
d) Feedback inhibition involves products binding to the active site to prevent enzyme activity.