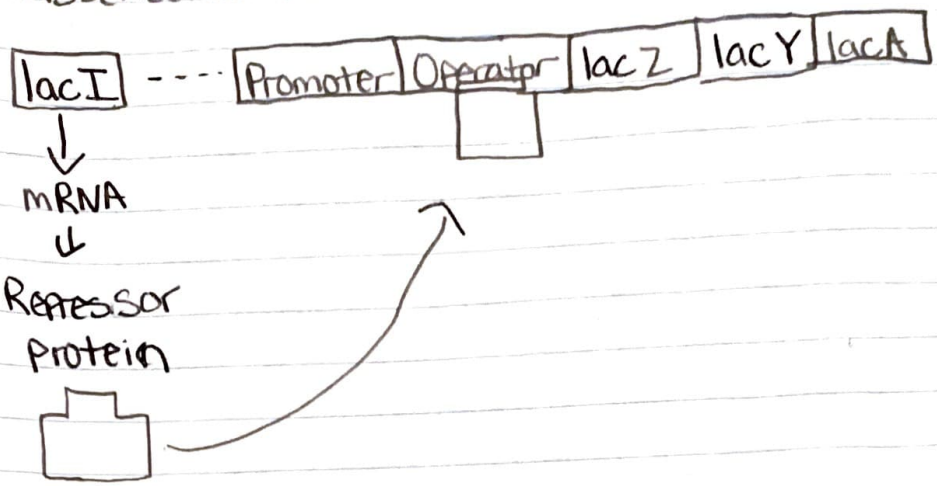
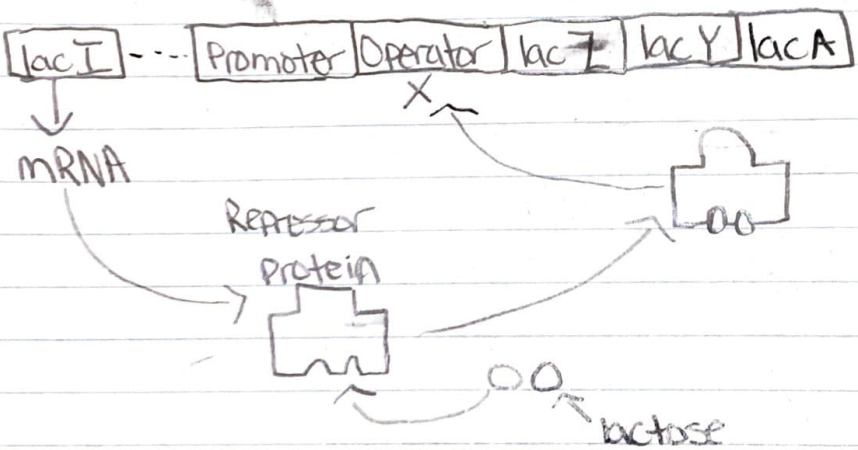
Olivia White

1.) Absence of lactose



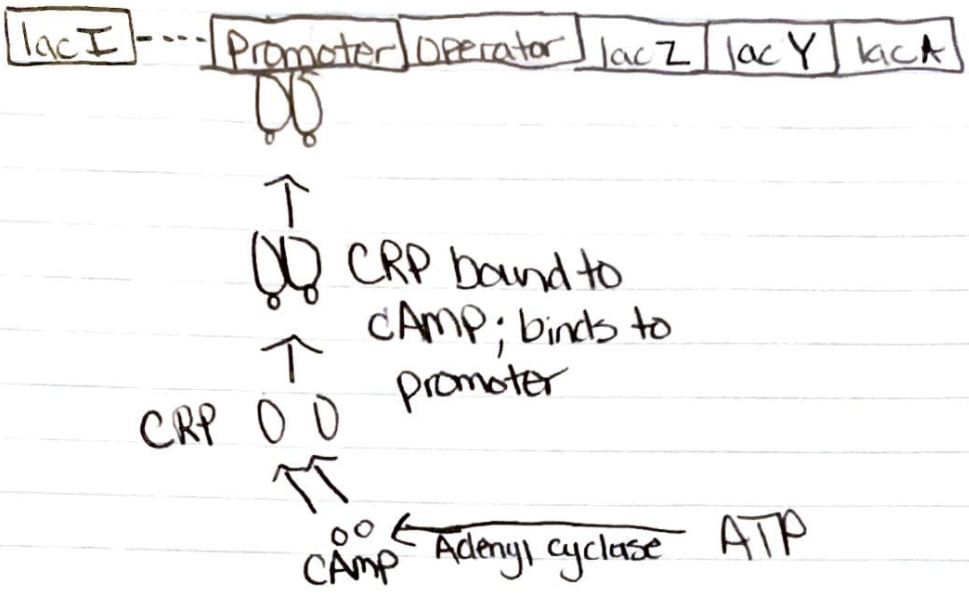
In the absence of lactose, lacI produces a repressor protein which binds to the operator and does not allow for gene expression.

2.) Presence of lactose



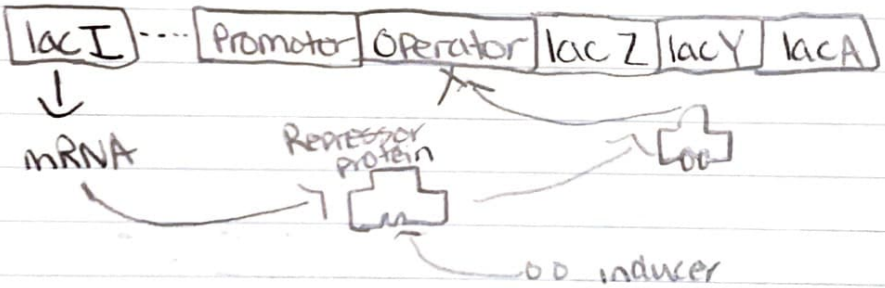
Lactose acts as an inducer. When lactose binds to the repressor protein, it changes its conformation which inhibits the repressor from binding to the operator. Because the operator is not inhibitted, gene expression begins.

3.) Absence of glucose



In the absence of glucose, adenyl cyclase converts ATP to cAMP which then binds to CRP. The CRP then binds to the promoter which enhances the activity of RNA polymerase leading to gene expression.

4.) Presence of glucose and lactose



In the presence of glucose and lactose, glucose will be used first. With either source, the operator cannot be inhibited and genes will be expressed.

- This process occurs during transcription