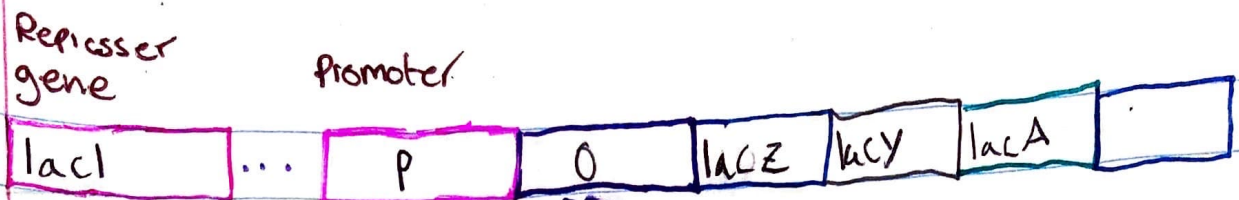


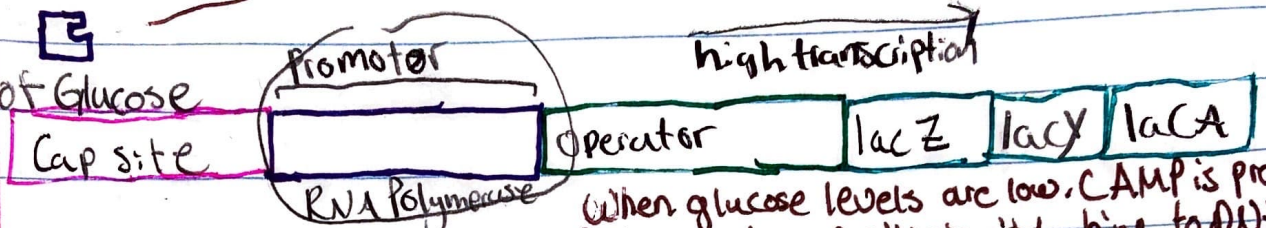
# 1) Absence of lactose



↓  
mRNA  
↓  
Repressor Protein

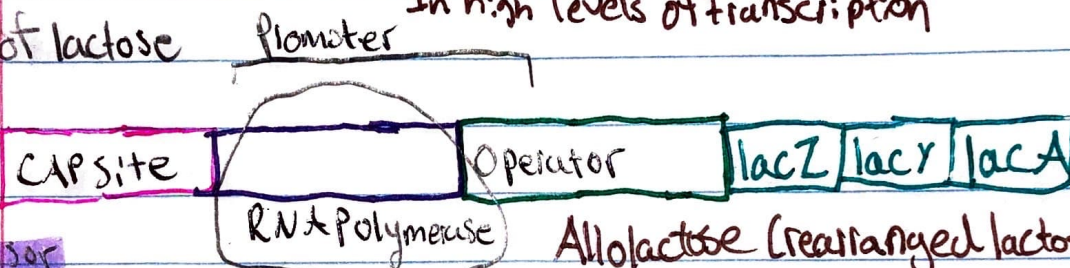
No lactose in cell, Repressor Protein is bound to operator; Z, Y, A genes can't be expressed

## 2) Absence of Glucose



When glucose levels are low, CAMP is produced. The CAMP attaches to CAP allowing it to bind to DNA. CAP helps RNA polymerase bind to the Promoter, resulting in high levels of transcription

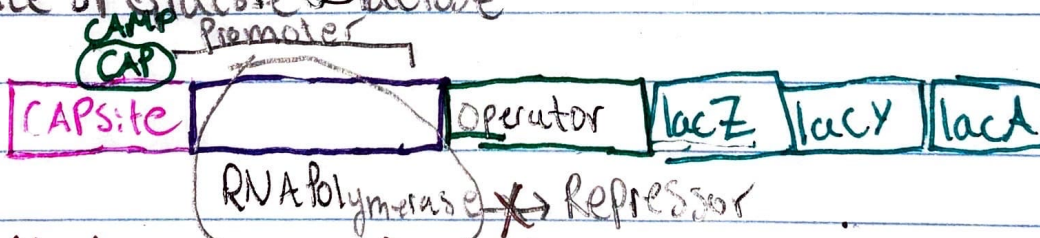
## 3) Presence of lactose



Allolactose (rearranged lactose) binds to

the lac repressor & makes it let go of the operator. RNA polymerase can now transcribe the operon

## 4) Absence of Glucose & Lactose



No transcription of the lac operon occurs. CAMP levels are high because glucose levels are low so. CAP is active & will bound to the DNA. The lac ~~operator~~ Repressor will also be bound the operator, acting as a roadblock to RNA polymerase preventing transcription