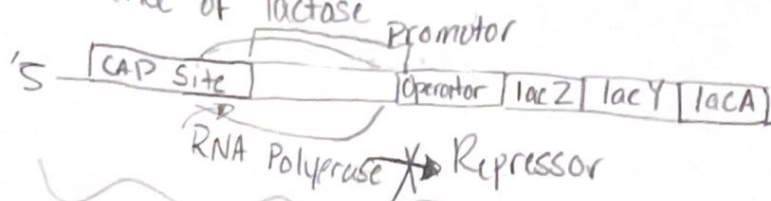


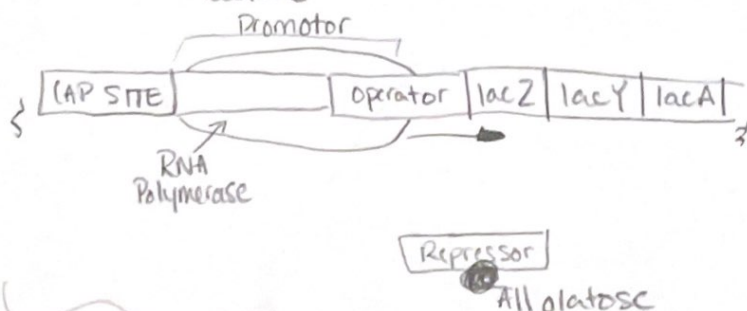
Escherichia coli

1. Absence of lactose



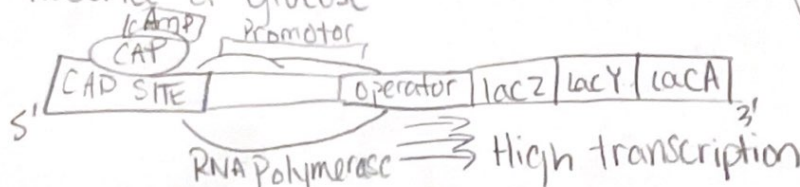
When lactose is absent, the lac repressor binds tightly to the operator. It gets in the RNA Polymerase way, preventing transcription.

2. Presence of lactose



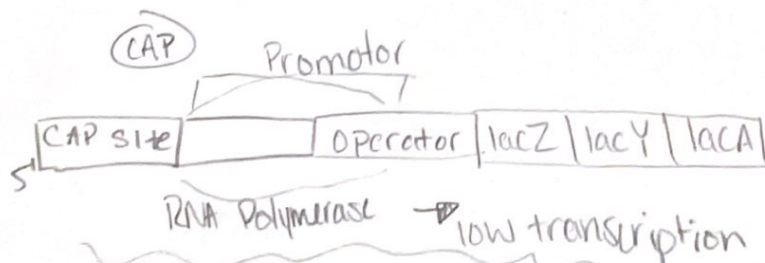
Allolactose binds to the lac repressor and makes it let go of the operator. RNA polymerase can now transcribe the operon.

3. Absence of glucose



When there is absence of glucose cAMP is produced. cAMP attaches to CAP, allowing it to bind to DNA. CAP helps RNA polymerase bind to the promotor, resulting in high levels of transcription.

4. Presence of glucose



When glucose is present in high amounts, no cAMP is made. CAP cannot bind DNA without cAMP, so transcription occurs at a lower level.

5. Gene Expression is the synthesis of a polypeptide chain of a functional protein by using the info encoded in the corresponding gene. Transcription happens when the Promotor and polymerase bind and then transcribe. When the RNA Polymerase is freed to generate numerous copies of mRNA encoding the lac enzymes. Then translated into proteins, these allow the E. coli to transport and metabolize.