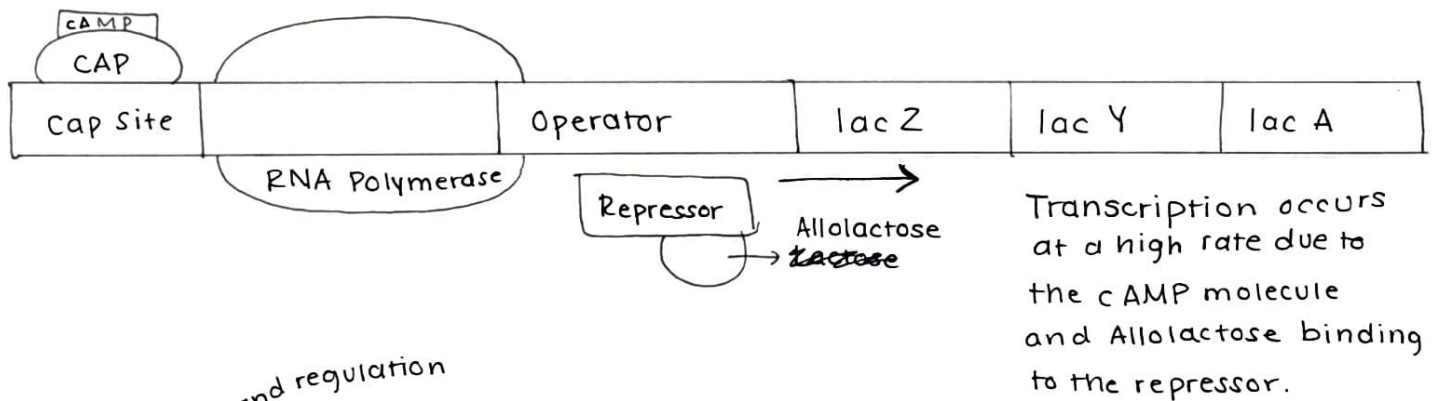


When e. coli have low glucose levels, cAMP is produced to bind DNA + CAP together to upregulate transcription.

4) Absence of glucose and presence of lactose



The expression of <sup>and regulation</sup> the lac operon occurs before the transcription of this specific sequence. The synthesis of the lac Z, lac Y, and lac A proteins occur when there are low ~~to~~ levels (or no) glucose available, since ~~e. coli~~ glucose is a much easier source of energy for e. coli to use instead of lactose. This regulation of the lac operon sequence of DNA must occur so that the appropriate enzymes can be produced to catabolize lactose for energy.