7.003 Spring 2022
Day 13 In-Lab Questions

1) Today you received the results of the plasmid recovery sequencing reactions. Some groups in the class found that the transposon integration occurred into *STE* genes. Is this result reasonably expected? Explain.

2) Some groups in the class found that the transposon integration occurred into genes other than *STE* genes. Is this result reasonably expected? Explain.

3) In all previous semesters so far, the *STE18* gene (the γ subunit of the heterotrimeric G-protein coupled to the α-factor receptor) has never been isolated, even though many other *STE* genes have been isolated many times. What are some possible explanations for this phenomenon?

4) Some groups in the class found that the transposon integration occurred in rDNA genes (genes that encode the ribosomal RNAs that form the ribosome structure).

A) Do you think a transposon integration into rDNA genes would be able to specifically cause an αF-resistant mutant phenotype? Why or why not?

B) How might an rDNA gene have come up in our 7.003 mutagenesis screen?

5) Consider a gene, Gene X, whose gene product is upregulated in cells during Condition Y. State at least four different ways in general that a cell could be regulating expression of that Gene X product (hint: think about it in terms of Central Dogma). What are some experimental techniques that would allow you to distinguish between those four methods of gene expression regulation in a cell?

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