Genetics Day 5 notes
(Eric Sullivan)

I. Homologous recombination

Homologous – strands are (sequentially) identical
Recombination – exchange of DNA between two DNA strands

- Draw our donor recombining with the host (need an even number of crosses to retain circular DNA (or cells die)) and then draw a nucleotide level view

Q: Where did our donor come from?
A: P1 infected our pNK/KBS1 Ara\(^{-}\) mutants

II. Generalized transduction:

- Transduction: movement of DNA via viral intermediate
- Generalized Transduction: any host DNA can be transferred (non-specifically)

Q: Why are we moving the DNA?
A: Stability, separate transposon from transposase

Q: Is transposition considered homologous recombination?
A: No, there’s no homology between insert and host DNA

Q: What happens during infection?
A: Draw out different Cells and infections

(If we did the) C600 mapping experiment:
clarify – still used today, if you don’t know where an insert is located ahead of time

Q: What nearby genetic loci would we be mapping?
A: thr and leu

Q: Are we actually looking at the leu gene (Leu\(^{+}\) vs. Leu\(^{-}\))? 
A: No, Cm is inserted, so we follow Cm\(^{R}\) instead

Q: If our donor is Kan\(^{R}\), Ara\(^{-}\), Cm\(^{R}\), and Thr\(^{+}\), what must the recipient be?
A: The opposite (Kan\(^{S}\), Ara\(^{+}\), Cm\(^{S}\), and Thr\(^{-}\))

- Draw crossover example
- Next time we’ll use numbers to see how we can determine the actual order.
III. Choosing Controls:

Everyone will need to have chosen controls before entering lab on day 6:

<table>
<thead>
<tr>
<th>LB Cm</th>
<th>LB Kan</th>
<th>Mac Ara Kan</th>
<th>LB X-gal Kan</th>
<th>LB Ara X-gal Kan</th>
</tr>
</thead>
</table>

- Need positive and negative control – one that grows/shows and one that doesn’t for each phenotype the plates test i.e. LB Kan, pos = Kan$^R$ and neg = Kan$^S$

- Also, Patch the control onto all plates, not just the one(s) it’s checking