

Due Friday February 29, 2008 Staple!

3. You isolate some yeast mutants that won't grow on minimal media. You do a complementation test by mating your various mutants, plating and growing them on complete media then replica plating them onto minimal media. The results are shown below. A + indicates growth on minimal media

a) What are the complementation groups and their members?

b) How many different genes have you isolated mutants in?

	1	2	3	4	5	6	7	8
1	-	+	-	+	+	+	+	+
2	+	-	+	+	+	-	+	+
3	-	+	-	+	+	+	+	+
4	+	+	+	-	+	+	-	-
5	+	+	+	+	-	+	+	+
6	+	-	+	+	+	-	+	+
7	+	+	+	-	+	+	-	-
8	+	+	+	-	+	+	-	-

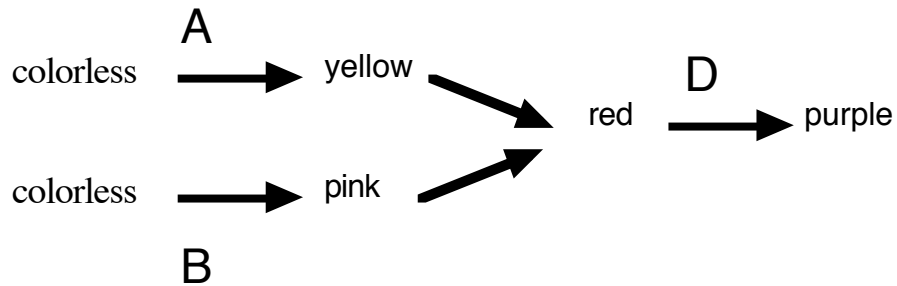
4. Five mutants were isolated, in different complementation groups that could not grow on minimal media. They were in different complementation groups in one biochemical pathway. What is the order of the reactants, products and mutant enzymes in this pathway?

substance added:		<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>
mutant	1	+	-	-	+	-	+
	2	-	-	-	+	-	-
	3	+	+	+	+	-	+
	4	+	-	-	+	-	-
	5	+	+	-	+	-	+

a) Draw out the pathway of biosynthesis showing the order of substance production and arrows indicating the direction of synthesis and numbers for the location of action for the normal versions of the genes that are mutated in each mutant.

b) It turns out that one of the substances is not actually part of the pathway. What substance is it, and how do you know?

5. Below is the pathway used to make color in a flower species. The absence of all color in a flower makes the flower white. Strain 1 is aaBBdd, and strain 2 is AAAbbDD. Assume the recessive mutations are entirely non-functional. Note that red is only made if yellow and pink are both present, it requires the function of a fourth enzyme not at issue here.



Give the phenotypes (and expected fractions if applicable) for each of the following:

- Strain 1
- Strain 2
- F1s
- F2s