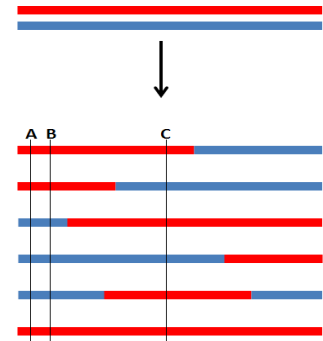


Practice Thought Questions/ Problems for Week 3

1) From the image from lecture on the right, which rows of offspring below (assume they're numbered 1-6) are recombinant between genes A and C?

2) If crossing over never happens within chromosomes, can any gametes be "recombinant" relative to the parents?

3) How can one know the order of genes along chromosomes without having an assembled genome sequence?



4) True/ False. If two genes are freely recombining, then in a test cross, you should have roughly as many offspring that are "recombinant" as "parental" in terms of those two genes.

5) If two genes are completely linked, how many offspring will be recombinant between them?

6) Figure out the recombinational distances between each pair of genes, and identify which gene is in the middle, from this example.

ABC/abc x abc/abc yields these progeny--

ABC/abc: 448

abc/abc: 449

ABc/abc: 34

aBc/abc: 15

Abc/abc: 1

aBC/abc: 1

abC/abc: 37

AbC/abc: 15

7) In the example above, the sum of the recombination fractions A-C and A-B is greater than that of B-C. Why is that?

8) If you see a strong association between alleles at a SNP and a disease in a cross/ pedigree, that means that the SNP causes the disease, yes?

9) You're trying to map what you think is a single gene with alleles causing hypertension in a population. You've tested two markers and have the following results on 1000 people, of whom 200 are afflicted. Which marker is associated with hypertension?

AA: 250 people surveyed, 50 have hypertension

Aa 500 people surveyed, 100 have hypertension

aa: 250 people surveyed, 50 have hypertension

BB: 490 people surveyed, 98 have hypertension

Bb: 420 people surveyed, 84 have hypertension

bb: 90 people surveyed, 18 have hypertension