

A FEW NOTES ABOUT COMPREHENSIVE EXAMS:

1. About half of the point value on my comprehensive exams is "Mendelian Genetics": Punnett squares, pedigrees, product rule, "or rule". IF YOU HAVEN'T MASTERED THESE TYPES OF PROBLEMS, YOU WON'T PASS THE EXAM. So PRACTICE!!
2. You want to do well the first time you take the exam. Your FIRST score is used in calculating your "departmental rank". In addition, if your rank is high, we might report it on your recommendations to grad school.
3. Watch for review sessions in January or February. I will offer at least one.

NOW ON TO THE EXAM:

BIO212 Comprehensive Examination: Spring, 2008 NAME: _____
 50 points, 30 minutes. Passing is 60%.

1. [12 pts] In each blank, write the code corresponding to the definition/description of each term. [1 pt ea]

- | | | |
|--------------------------|---------------------------------|-----------------------------|
| _____ Alleles | _____ Metastasis | |
| _____ Restriction Enzyme | _____ SNP | _____ Epistasis |
| _____ Codominance | _____ Apoptosis | _____ Genomic imprinting |
| _____ Haplotype | _____ X chromosome inactivation | _____ Incomplete penetrance |

- A1. A cell becoming cancerous.
- A2. A dominant form of a gene hiding the recessive form.
- A3. All children share the phenotype of the mother.
- B. Blocking of the expression of one gene by another at a different locus.
- C3. Creates mosaics in female mammals.
- C4. Cuts DNA at specific sequences.
- D1. Different forms of a gene.
- D2. Disease causing gene mutation.
- L. Looks for DNA damage.
- M. Makes copies of DNA.
- N. Not everyone with the genotype shows the phenotype.
- P1. People with the same genotype show different degrees of phenotype.
- P2. Places in genome where people differ by individual nucleotides.
- P3. Programmed cell death.
- S1. Set of linked genes usually inherited together.
- S2. Spreading of cancer cells from one location to another.
- T1. The heterozygote displays both phenotypes.
- T2. The heterozygote has an intermediate phenotype.
- T3. The phenotype is different depending on whether the allele comes from the mother or father.
- T4. Transcribes DNA into RNA.

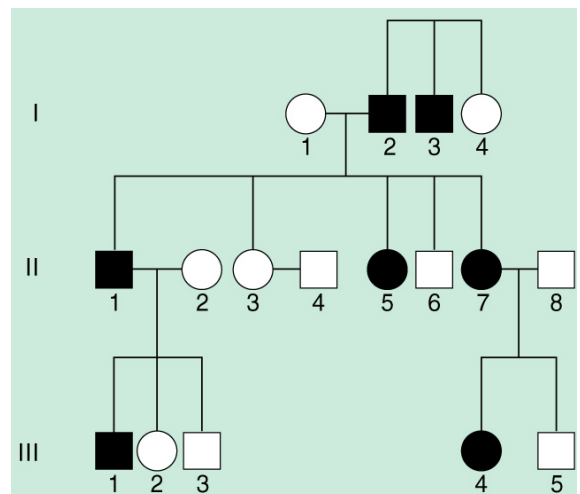
2. [3 pts] A woman appears to be perfectly healthy, but she only has 45 chromosomes. Which chromosome is likely to be missing? Justify your choice, in a sentence or two.

3. [5 pts] a. What type of inheritance would you say this pedigree shows?

b. If III-1 marries III-IV, what's the chance that their child will have the disorder?

4. [6 pts] In each of the following situations, describe the likelihood that the couple's child will have the disease/trait:

- A. Two people with cystic fibrosis [autosomal recessive] marry. _____
- B. A normal woman whose father had albinism marries a normal man whose mother had albinism.



C. A woman with Huntington's Disease [a rare autosomal dominant] marries a normal man.

5. [8 pts] You're going to cross a fly of genotype AaBbddEe with one of genotype that's homozygous recessive for all 4 traits.

A. How many genetically different gametes can the first parent

make? _____

B. How many can the second parent make? _____

C. What portion of the offspring will show all 4 recessive traits?

7. [8 PTS] What's the difference between a TUMOR SUPPRESSOR and an ONCOGENE? What's the role of the normal form of each, and what happens when each is mutated? [3-4 SENTENCES]

8. [3 pts] What is a "pseudogene", and where does it come from? 1-2 sentences)?
