

Quiz #3

Chapter 3- Genetics and Genomics

1. Describe how mammals are cloned.
2. T/F When a mammal is cloned from the genome of an adult, it will show signs of premature aging.
3. What is therapeutic cloning? What might its benefits be?
4. Which area of genetics involves the laws of inheritance?
a. Population Genetics b. Cellular Genetics c. Behavioral Genetics
d. Mendelian Genetics e. Phylogenetics
5. T/F The basic division of life on Earth is between prokaryotes and eukaryotes.
6. Cell division occurs within two basic kinds of cells. Which are they?
7. T/F Stem cells are able to differentiate into any somatic cell type.
8. A eukaryote cell contains: (select those that apply)
a. nucleus b. cytoplasm c. mitochondrion d. endoplasmic reticulum e. prokaryote
9. What are the four bases that lie within DNA?
10. DNA consists of ____ separate strands.
a. 2 b. 3 c. 4 d. 6 e. 8
11. RNA differs from DNA in that thymine is replaced by
a. cytosine b. uracil c. phosphate d. guanine e. purine
12. T/F Mutations can have profound effects on the biology of offspring.
13. T/F Genes are the fundamental unit of heredity.
14. How many genes do humans have?

15. Cell division resulting in the development of two daughter cells identical to the mother cell defines
a. mitosis b. meiosis c. crossing over d. mitochondriosis e. protein synthesis
16. T/F One of the functions of meiosis is to produce a gamete with the haploid number of chromosomes.
17. The 23rd pair of chromosomes are known as
a. autosomes b. genomes c. ribosomes d. sex cells e. sex chromosomes
18. T/F In diploid organisms chromosomes come in homologous pairs.
19. The sex of an offspring depends on whether
a. the sperm carries an X or Y chromosome b. the ovum carries an X or Y chromosome
c. the X is dominant to the Y d. the Y is dominant to the X
20. T/F Males inherit X-linked genes only from their mothers.
21. The location of a gene on a chromosome is the:
a. locus b. chromatid c. homozygote d. centromere e. karotype
22. A zygote is: (select those that apply)
a. a fertilized egg b. composed of a maternal and a paternal gamete c. an early embryo
d. the product of meiosis e. the product of mitosis
23. T/F Downs syndrome results from a chromosomal abnormality.
24. T/F Individuals with two copies of the same allele are called homozygotes.
25. When heterozygous parents mate their offspring will be:
a. all homozygous b. all heterozygous c. half homozygous and half heterozygous d. 75% homozygous 25% heterozygous e. mutant
26. How is mitochondrial DNA different from nuclear DNA?
27. T/F PCR has made it possible to discover the genetic intersection of humans and Neandertals.

From Genotype to Phenotype

1. Who was Gregor Mendel? When did he conduct his research? How long did it take for his findings to be accepted?

2. When Mendel crossed peas with two contrasting traits--form and color--he found that in the offspring:
 - a. only dominant traits appeared
 - b. the distribution of one trait did not affect the distribution of the other
 - c. only the recessive traits appeared.
 - d. form dominated color
3. When Mendel crossed peas with Rr and Rr alleles, the chances of getting rr offspring were:
 - a. 100%
 - b. 75%
 - c. 50%
 - d. 25%
4. Mendelian dominance means that a dominant trait:
 - a. will in time drive a recessive trait out of existence
 - b. is stronger and healthier than a recessive trait
 - c. prevents the appearance of a recessive trait
 - d. is more adaptive than a recessive trait.
 - e. all of the above
5. What is the difference between genotype and phenotype?
6. How does a recessive allele express itself in the phenotype of an individual?
7. What is an example of co-dominance?
8. T/F Most traits of polygenic.
9. What are the four phenotypes in the ABO blood system?
10. Which blood type is the universal donor?
11. What is Mendel's law of independent assortment?
12. T/F Huntington Disease is caused by an insertion mutation.
13. T/F The vast majority of mutations have a neutral effect.
14. T/F Bad mutations can be lethal.
15. T/F The Y and X chromosomes contain an equal number of genes.
16. An example of an x-linked disorder:
 - a. Sickle cell Disease
 - b. Huntington Disease
 - c. Hemophilia
 - d. Cystic Fibrosis

17. Why do x-linked disorders typically skip a generation?
18. T/F Prenatal genetic screening (amniocentesis) now makes it possible to forecast the severity of genetic diseases such as Down Syndrome and Sickle Cell Anemia.
19. T/F Sickle cell is found in the highest frequencies where malaria is found in highest frequencies.
20. It is certain people who carry the sickle cell trait will:
a. will eventually die from sickle cell anemia b. die from malaria c. be protected from malaria d. produce children who will themselves suffer from sickle cell anemia
21. What might people with sickle cell trait suffer from?
22. How are twin studies used in genetic research?
23. T/F Genes determine behavior.
24. What is an example of a trait that is only expressed in one sex?
25. What is the difference between sex and gender?
26. T/F The risk of giving birth to a Down syndrome child increases with the age of the mother.
27. T/F Defective sperm may cause Down syndrome.
28. T/F Older fathers have been linked to increased rates of autism.
29. T/F Men with the XYY chromosome pattern tend to be aggressive and anti-social.
30. How might a couple who know they are both carriers for Tay Sachs disease ensure that their children are not afflicted?
31. Why might a pregnant woman have an amniocentesis test?
32. Who could have the same DNA as you?

33. T/F A woman can now give birth to a baby that is not genetically related to her.
34. How might a child be produced that is genetically related to two (gay) men?
35. At what age does a woman's fertility begin to decline?
36. T/F Human eggs can now be successfully frozen.
37. How might a post-menopausal woman be able to give birth to a baby that is genetically related to her?
38. What are some examples of assisted reproductive technologies that are currently available? What are the benefits and liabilities of using them?

Curse and Blessing of the Ghetto

1. What disease were those who carried the Tay-Sachs gene protected from?
a. typhoid b. polio c. tuberculosis d. sickle cell anemia e. smallpox
2. T/F Victims of Tay-Sachs can expect to live to about 25.
3. Why was Tay-Sachs more common amongst the Jews who lived in crowded Eastern European ghettos than amongst non-Jewish peasant farmers?
4. Tay-Sachs is caused by:
a. having a dominant gene b. having a single recessive gene c. having a pair of recessive genes d. having a mutated chromosome