

## DNA

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. Which of the following is the template for the production of RNA within a cell?

- A. DNA                      B. ATP  
C. protein                    D. carbohydrate

2. Which sequence of DNA bases would pair with the ones shown in the partial strand below?

1        2        3  
ATG TGA CAG

- A. 1        2        3  
ATG TGA CAG
- B. 1        2        3  
TAC ACT GTC
- C. 1        2        3  
GTA AGT GAC
- D. 1        2        3  
CAT TCA CTG
3. What molecules do both DNA and RNA contain?

- A. uracil                    B. thymine  
C. nucleotides              D. deoxyribose

4. Which of the following *best* describes how DNA and RNA are similar?

- A. They both contain the nitrogen bases thymine and adenine.
- B. They both are formed in a double-helix structure.
- C. They both are composed of five different nucleotides.
- D. They both contain the nitrogen bases cytosine and guanine.

5. Codons Found in Messenger RNA

		Second Base					
		U	C	A	G		
First Base	U	Phe	Ser	Tyr	Cys	U	
	U	Phe	Ser	Tyr	Cys	C	
	U	Leu	Ser	Stop	Stop	C	
	U	Leu	Ser	Stop	Trp	A	
First Base	C	Leu	Pro	His	Arg	U	
	C	Leu	Pro	His	Arg	C	
	C	Leu	Pro	Gln	Arg	A	
	C	Leu	Pro	Gln	Arg	G	
First Base	A	Ile	Thr	Asn	Ser	U	
	A	Ile	Thr	Asn	Ser	C	
	A	Ile	Thr	Lys	Arg	A	
	A	Met	Thr	Lys	Arg	G	
First Base	G	Val	Ala	Asp	Gly	U	
	G	Val	Ala	Asp	Gly	C	
	G	Val	Ala	Glu	Gly	A	
	G	Val	Ala	Glu	Gly	G	

A strand of mRNA containing the repeating sequence AAGAAGAAGAAG could code for which of the following amino acid sequences?

- A. lys–arg–glu–lys            B. ser–ser–glu–glu  
C. lys–arg–lys–arg            D. lys–lys–lys–lys

6. 5' ATCAGCGCTGGC 3'

The above sequence of DNA is part of a gene. How many amino acids are coded for by this segment?

- A. 4      B. 8      C. 12      D. 20

7. A scientist puts nucleotide chains of UUUUUU in a test tube under conditions allowing protein synthesis. Soon the test tube is full of polypeptide chains composed of only the amino acid phenylalanine. What does this experiment indicate?

- A. The amino acid phenylalanine is composed of uracil.  
B. UUU codes for the amino acid phenylalanine.  
C. Protein synthesis malfunctions in test tubes.  
D. Most proteins contain only one type of amino acid.
8. Which of these would *most* likely cause a mutation?
- A. the placement of ribosomes on the endoplasmic reticulum  
B. the insertion of a nucleotide into DNA  
C. the movement of transfer RNA out of the nucleus  
D. the release of messenger RNA from DNA

9. One human disease is caused by a change in one codon in a gene from GAA to GUA. This disease is the result of
- A. a mutation.      B. a meiosis error.  
C. crossing-over.      D. polyploidy.

10. A base sequence is shown below.

ACAGTGCG

How would the base sequence be coded on mRNA?

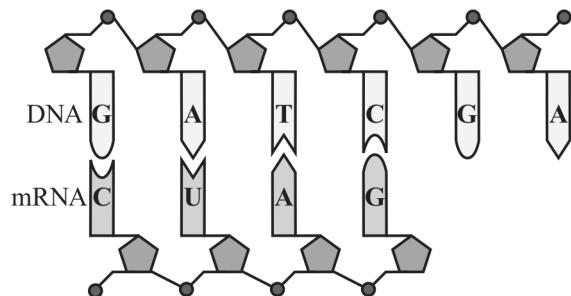
- A. TGTCA CG      B. GUGACAU  
C. UGUCACG      D. CACUGUA

11. Semi-conservative replication of DNA refers to the idea that

- A. DNA molecules need to unwind before duplication begins.  
B. each new DNA molecule contains two new single RNA strands.  
C. the two strands of DNA molecules run in opposite directions.  
D. each half of the original DNA molecule is joined with a new complementary DNA strand.

12. Mutations within a DNA sequence are
- natural processes that produce genetic diversity.
  - natural processes that always affect the phenotype.
  - unnatural processes that always affect the phenotype.
  - unnatural processes that are harmful to genetic diversity.
14. Which of the following statements *best* describes a DNA molecule?
- It is a double helix.
  - It contains the sugar ribose.
  - It is composed of amino acids.
  - It contains the nitrogenous base uracil.

13. The diagram below shows a strand of DNA matched to a strand of messenger RNA.



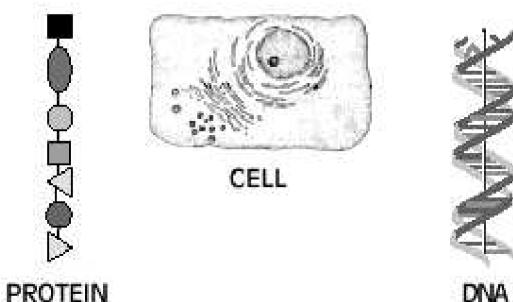
What process does this diagram represent?

- mutation
- respiration
- transcription
- translation

14. Which of the following statements *best* describes a DNA molecule?

- It is a double helix.
- It contains the sugar ribose.
- It is composed of amino acids.
- It contains the nitrogenous base uracil.

- 15.



What is the relationship between the three structures in the diagram above?

- DNA is produced by protein which is produced in the cell.
- Protein is composed of DNA which is produced in the cell.
- DNA controls the production of protein in the cell.
- A cell is composed only of DNA and protein.

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DNA      XXXX-XX-XX

1.  
Answer: A

2.  
Answer: B

3.  
Answer: C

4.  
Answer: D

5.  
Answer: D

6.  
Answer: A

7.  
Answer: B

8.  
Answer: B

9.  
Answer: A

10.  
Answer: C

11.  
Answer: D

12.  
Answer: A

13.  
Answer: C

14.  
Answer: A

15.  
Answer: