Unit 7 Review KEY 3/2/16

Genetic Code

I. Instructions for translating information into proteins
II. Alignment and sequence of genes on a chromosome
III. Composed of nucleotide triplets
IV. Common to all living organisms

3 all these characteristics make up the genetic code

Which statement below explains why some microorganisms have the ability to repair a malfunctioning gene by using the human version of the gene?

IV Common to all living organisms

Central Dogma

What is the function of mRNA in the diagram above?

carries the genetic message from DNA in the nucleus to the ribosome

anticodon

What is the structure that is labeled by an X?
What part of protein synthesis does this diagram represent?
What is the specific destination of X?

tRNA
mRNA
at the ribosome

Second Base in Codon

First Base in Codon	U	C	A	G	Third Base in Codon
U	Phenylanine	Serine	Tyrosine	Cysteine	U
	Phenylanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	Isoleucine	Threonine	Asparagine	Serine	U
	Isoleucine	Threonine	Asparagine	Serine	C
	Isoleucine	Threonine	Lysine	Arginine	A
	Methionine	Threonine	Lysine	Arginine	G
G	Valine	Alanine	Aspartic Acid	Glycine	U
	Valine	Alanine	Aspartic Acid	Glycine	C
	Valine	Alanine	Glutamic Acid	Glycine	A
	Valine	Alanine	Glutamic Acid	Glycine	G

GUG - CAU - ACG - UUU - UA

Given the DNA sequence 5'-CAC|GTA|TGC|AAA|ATT-3', the primary structure of the protein it codes for is described as —

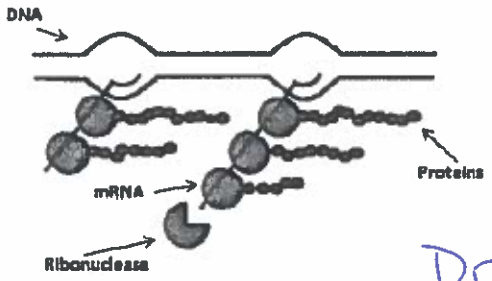
Val - Hist - Threonine - Phenyl - Stop

The following chart outlines some of the differences in protein synthesis in prokaryotes and eukaryotes.

Protein Synthesis

	Prokaryotes	Eukaryotes
Order of protein synthesis	Coupled transcription-translation	Transcription must finish before translation begins
Introns and exons	Do not contain introns	Contain both introns and exons
Size of ribosome	Small	Large
Chromosome structure	1 circular chromosome	Many linear chromosomes

Based on the information in the chart above, what can you determine about the model below?



→ No nucleus
→ transcription + translation happening at the same

PROKARYOTE

DNA

Which of the following best describes the main purpose of the sequences of nitrogenous bases in DNA?

The procedure for creating a DNA fingerprint consists of first obtaining a sample of cells containing DNA, extracting the DNA from those cells, and then purifying it. The DNA is then cut at specific points along the strand with restriction enzymes. This produces fragments of varying length of DNA that are sorted by placing them in a gel and subjecting that gel to an electric current. The shorter the fragment, the more quickly it will move toward the positive pole (anode).
The separation of DNA fragments using electric current is called _____ and the banding patterns that this separation process results in can be used to _____.

gel electrophoresis
compare various genomes

Scientists plan and implement an investigation to show the differences and similarities in DNA sequences among various types of rodents. They want to analyze their genomes to see which are most closely related. What type of equipment and/or technology would be most important in this type of investigation?

gel electrophoresis and restrictive enzyme technology

What significant role does DNA play in the formation and development of an organism? encodes information

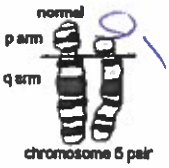
Which of the following statements best describes how the traits of an organism are determined by the DNA in their cells?
DNA codes for proteins which allows an organism to grow + function

The genetic code of organisms determines their traits. Which of the following DNA components make up the genetic code?
nitrogen bases

Any change in the sequence of DNA nucleotides is called a- mutation

Cell mutations within a DNA sequence are — natural events that produce genetic diversity

Mutated DNA sequences that can be passed from parent to offspring — occur in gametic cells



deletion in the p arm (loss of several genes

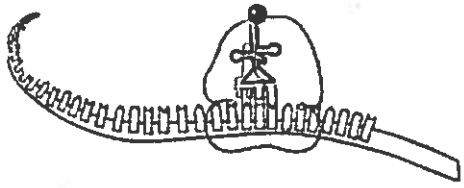
Mutated DNA in somatic cells occurs frequently but this modified DNA cannot be passed along to offspring because — only gametic cells carry genetic material to offspring

The following pair of words expresses a relationship.

CHLOROPLAST: GLUCOSE:: ribosome: protein

Write pairs of words best expressing a relationship similar to that in the pair of words above?

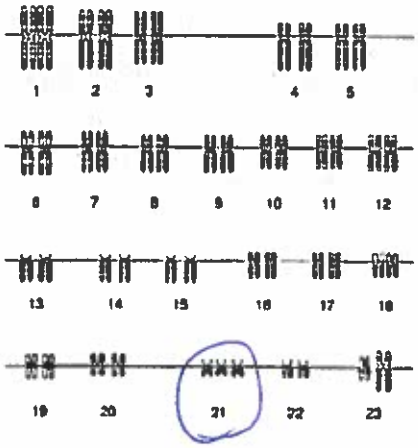
Which of the following describes a role that ribosomes assume in the production of proteins?



→ translates mRNA into a specific amino acid chain

What is the purpose of this process? to form polypeptides

Which type of ribonucleic acid is like a protein synthesis factory? rRNA



- 47 XY +21
- male
- down's syndrome +21

The human karyotype shown above experienced a nondisjunction during meiosis. The person with the karyotype above is a —

If a DNA template strand contains a triplet code of the following sequence of nitrogenous bases, the transcribed strand of RNA should have which sequence of bases?

3'-GCA-5' CGU

In eukaryotes, DNA never leaves the nucleus of the cell. Therefore, the genetic information is carried from the nucleus to the protein producing mechanisms by —

mRNA