

Supplemental Instruction - Biology 2300

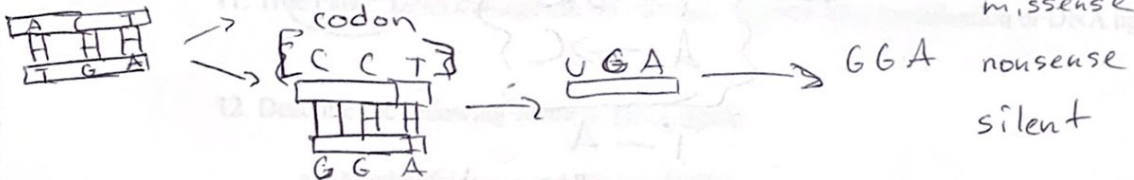
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Session 4 - DNA Repair

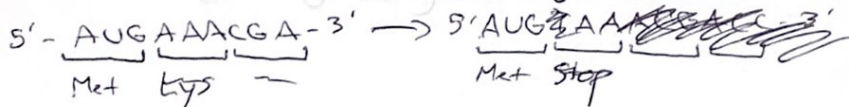
- Any change in the nucleotide sequence of DNA is deemed a mutation.
- Match the following:
 

a. <u>Deletion</u>	<u>c</u> one base pair changed.
b. <u>Insertion</u>	<u>d</u> base pair order changed.
c. <u>Point mutation</u>	<u>a</u> one or more base pairs removed.
d. <u>Inversion</u>	<u>b</u> one or more base pairs added.

- Mutations within a gene can be divided into two general categories,
  - Nucleotide substitution, which is characterized by the replacement of one nucleotide with another. What are some of the effects that these kinds of mutations can have?



- Nucleotide insertion or deletion, characterized by the addition or removal of a nucleotide. What are some of the effects caused by this kind of mutation?



Frameshift Mutation

- Are DNA mutations detrimental? Explain.

Depends - Loss of function  
- Gain of function

- Mutagenesis: The production of genetic mutations caused by spontaneous errors that occur during DNA replication or mutagens. List some mutagens.

- hydrolysis
- mismatch bases
- UV, X-ray
- chemicals
- viruses

- What are Tautomers and what do they do? What kind of mutations can they cause?

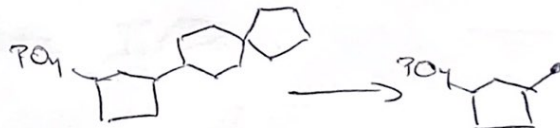
- Draw out the two different scenarios of replication slippage and their results.

Insertion or Deletion

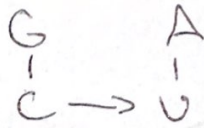
- What is the difference between:

a. Depurination:  
Purines - AG  
All Girls are pur

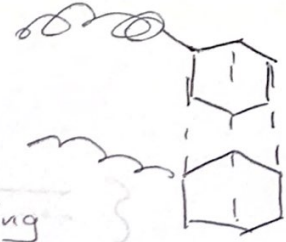
- removal of A or G



b. Deamination:



- different base pairing



9. Thymine dimers (mutation) can be formed by exposure to UV radiation. These mutations can be repaired via nucleotide excision repair (NER) di - two dimer

10. DNA damage can be repaired based upon single and double strand damage:

a. Single-strand damage:

UV radiation - NER

Replication errors - Mismatch repair

b. Double-strand breaks:

Non-homologous end joining

Homologous recombination

11. True/False: DNA damage can be correctly repaired after modification or DNA ligation.

12. Describe the following forms of DNA repair:

a. Nonhomologous end joining (NHEJ):

loss of nucleotides

b. Homologous recombination:

template, so no loss of nucleotides

two categories

~~or~~ - Nucleotide substitution

or

- Nucleotide I/D