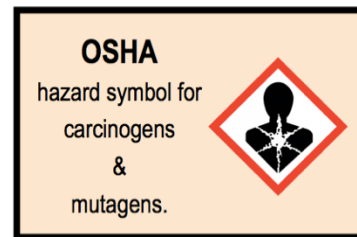
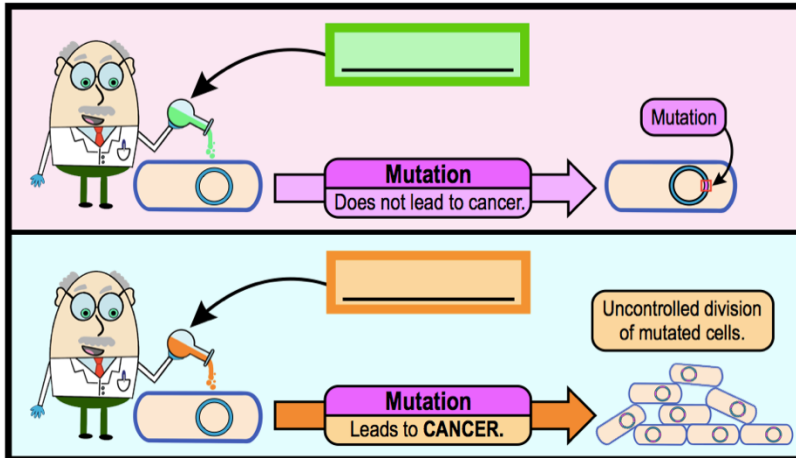


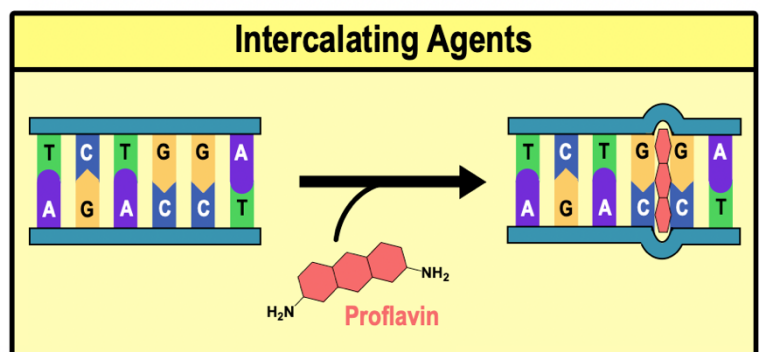
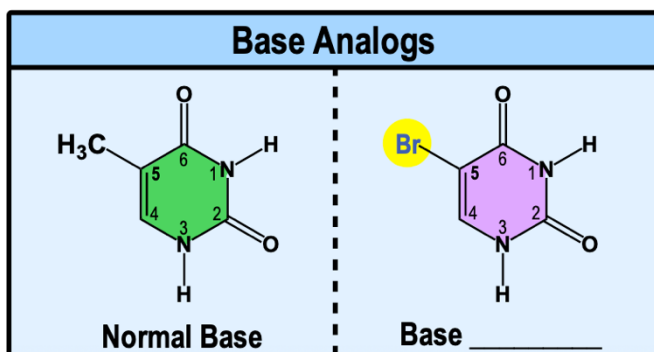
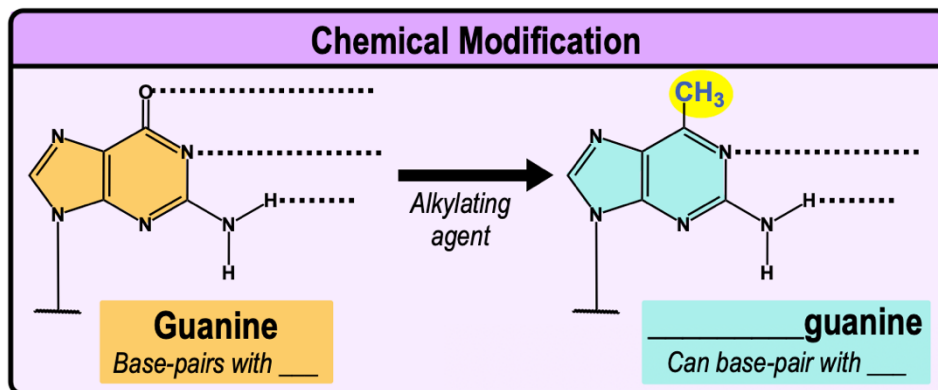
CONCEPT: METHODS OF INDUCING MUTATIONS

- **Recall:** _____ mutations are controlled, deliberate mutations that occur due to an external source.
- In order to increase the mutation rate in bacteria being studied, scientists typically use *mutagens*.
 - _____: chemical or physical agents that cause *mutations*.
 - **Carcinogens:** *mutagens* that contribute to the development of _____.



Chemical Mutagens

- **Chemical Modification:** chemicals that _____ the *structure* of nitrogenous bases in DNA (ex. alkylating agent).
 - Can alter the _____ - _____ ability of nucleotides.
- **Base Analog:** chemicals structurally _____ to nitrogenous bases but with *different* base-pairing properties.
- **Intercalating Agents:** flat molecules that _____ between 2 base-pairs & increase the chance of *point mutation*.



CONCEPT: METHODS OF INDUCING MUTATIONS

PRACTICE: 5-Bromouracil is structurally similar to a nucleobase and can be inserted into the DNA and perform base-pairing. 5-Bromouracil is a base _____ for the base thymine.

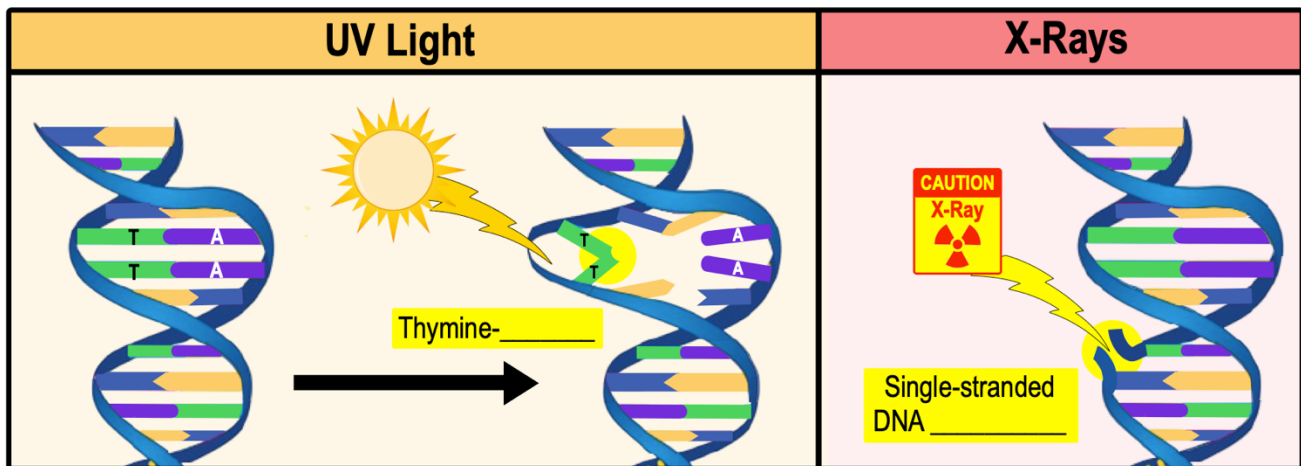
- a) Analog. b) Agent. c) Substitute. d) Modification. e) Replacement.

PRACTICE: Which of the following statements about mutagens and carcinogens is true?

- a) A mutagen is a chemical or physical agent which causes mutations in DNA.
b) A carcinogen is chemical or physical agent which causes mutations in DNA that lead to the development of cancer.
c) All carcinogens are mutagens, but not all mutagens are carcinogens.
d) All of the above statements are true.

Radiation Mutagens

- The exposure to certain types of _____ can cause mutations to occur.
 - ☐ **Light:** causes formation of nucleobase dimers that distort DNA structure.
 - ☐ _____ **Dimers:** occur when covalent bonds form between adjacent thymine bases in DNA.
 - ☐ DNA replication & transcription can NOT continue past the distortion & the cell dies.
 - ☐ **X-Rays:** cause single- & double-strand _____ in DNA.



PRACTICE: Which of the following wavelengths of light cause Thymine dimer mutations?

- a) X-Rays.
b) Microwaves.
c) UV light.
d) Visible light.