

CONCEPT: CARCINOGENS

- Cancer begins with _____ in the DNA of a cell
 - **Carcinogens** are substances that induce DNA damage which can lead to cancer
 - **Tumor initiators** are carcinogens that damage DNA directly
 - **Tumor promoters** don't cause mutations, but promote cancer is already mutated DNA

EXAMPLE:



- DNA damage includes
 - Loss of DNA damage repair systems
 - Telomere shortening
 - Viral genome integration
- Environmental factors can induce DNA damage
 - Tobacco
 - Viral exposure (HPV, HBV, HCV, etc..)
 - Diet and lifestyle choices

PRACTICE:

1. True or False: All carcinogens act by directly damaging DNA.
 - a. True
 - b. False

2. Which of the following is not a type of DNA damage?
- a. Loss of DNA repair and accumulation of mutations
 - b. Shortening of telomeres
 - c. Epigenetic modifications leading to gene suppression
 - d. Integration of a viral genome