Mutation and cancer
• DNA $\rightarrow$ RNA $\rightarrow$ protein $\rightarrow$ trait

• Genes contain the instructions necessary for a cell to work. If some of the instructions to the cell are wrong, then the cell may not know what to do!

• Mutated DNA $\rightarrow$ $\rightarrow$ $\rightarrow$ ?
Mutations

• Permanent change in the DNA sequence of a gene
• Inherited or acquired during lifetime
• Single mutations are often harmless but multiple mutations can result in cancer
• What causes mutations in DNA?
Carcinogens = Mutagens

- Physical or chemical agent that cause mutation in DNA
- Examples: UV light, tobacco, chemicals, x-rays

The Teenage Mutant Ninja Turtles were supposedly created by means of mutagens, as well as their master Splinter.

In the Halo series the Flood parasite produces a powerful mutagen, turning its hosts into either a "combat form" or "carrier form".
How do mutations cause cancer?

- DNA $\rightarrow$ RNA $\rightarrow$ protein
- Mutated DNA $\rightarrow$ mutated RNA $\rightarrow$ mutated protein
- Many mutations accumulated over time can result in harmful changes in the cells' instructions
- These mutations in genes result in mutations in proteins that control the cell cycle
Cell cycle

- Uncontrolled cell cycle = uncontrolled cell growth = tumor
Cancer

• Cancer can affect almost anyone at anytime in their lives
• Cancer can occur in almost any place in the body: Lung, skin, breast, prostate, colon, and even the blood (Leukemia)
We will investigate the effects of a carcinogen on bacteria
Serratia

- Red bacteria

- Exposure to carcinogens/mutagens such as UV light and tobacco can cause changes in bacterial DNA

- Changes in DNA result in changes in a protein
Mutations in Serratia cause a mutation in pigment protein. Mutated bacteria grow white.