CONCEPT: BACTERIAL TRANSFORMATION

● **Transformation** is when a bacterium takes up DNA from the environment

□ DNA can be in the _____ due to:

- Experimentally placed there

- Death and bursting of nearby bacteria – which release DNA into the environment

□ Only **competent** cells are capable of transformation

- Have a physiological state (natural, or experimentally induced) that allows the bacteria to take up DNA

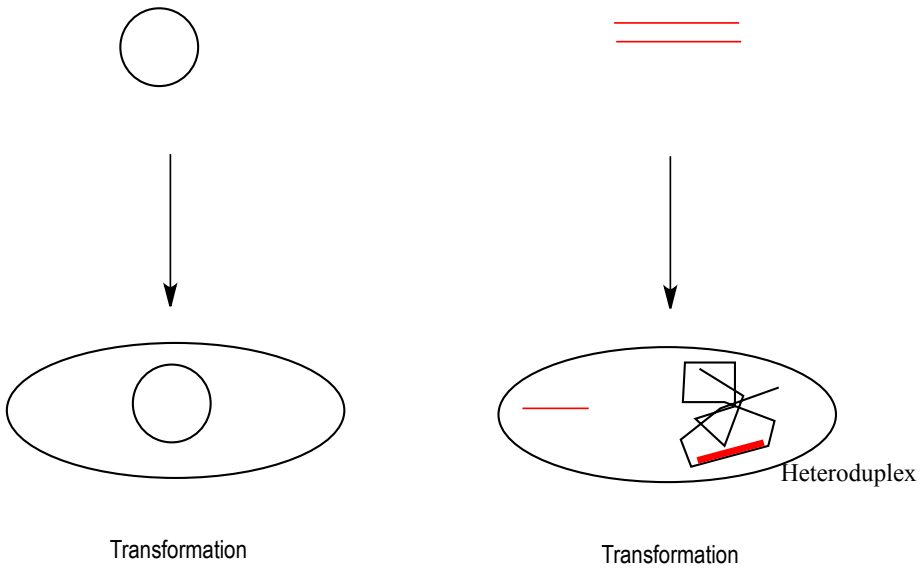
□ Transformed DNA can stay in two _____

1. It is a plasmid, that remains a plasmid once inside the bacterium

2. The double helix is digest to a single strand, and that aligns with the bacterial chromosome

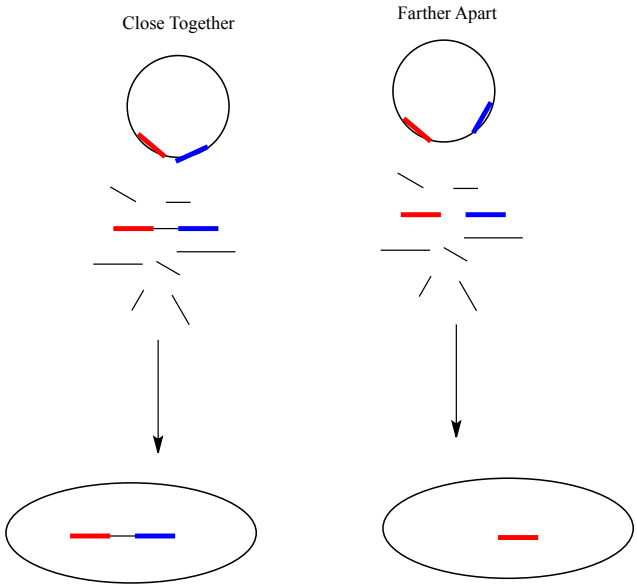
- A **heteroduplex** is formed between the single strand and the complementary chromosome

EXAMPLE:



- Transformation can also be used to map genes
    - □ Introduce _____ DNA (through extraction, enzymes, etc…)
        - The closer the two genes are, the more likely they'll be taken up together
        - **Double transformation** is when two genes are taken up together

EXAMPLE:



PRACTICE

1. Transformation is the process of what occurring with DNA?
    a. Two DNA physically exchange DNA
    b. Bacteria take up DNA from the environment
    c. DNA is degraded
    d. DNA jumps from one bacteria cell to another

2. Scientists must use what type of cells to transform DNA in the laboratory?
    a. Viable cells
    b. Animal cells
    c. Competent cells
    d. Heat sensitive cells

3. The DNA from a bacterium with the genotype a^+ b^+ c^+ is used to transform a bacteria with the genotype a b c. Gene pairs were checked for cotransformation with the following results. Using these results determine which genes are linked.

   a. A and B
   b. B and C
   c. A and C

Gene Pairs	Cotransformation
A and B	yes
B and C	no
A and C	no