**CONCEPT:** DNA CLONING

- **DNA cloning** is the process of assembling DNA molecules for experimental use (*genetic engineering)*

1. Obtain DNA that you want to manipulate

    - DNA extractions, Polymerase Chain Reaction of specific sequences,

2. Digest with **restriction endonucleases (enzymes)** which cut DNA at specific sequences

3. "Paste" the desired fragment into a *vector*

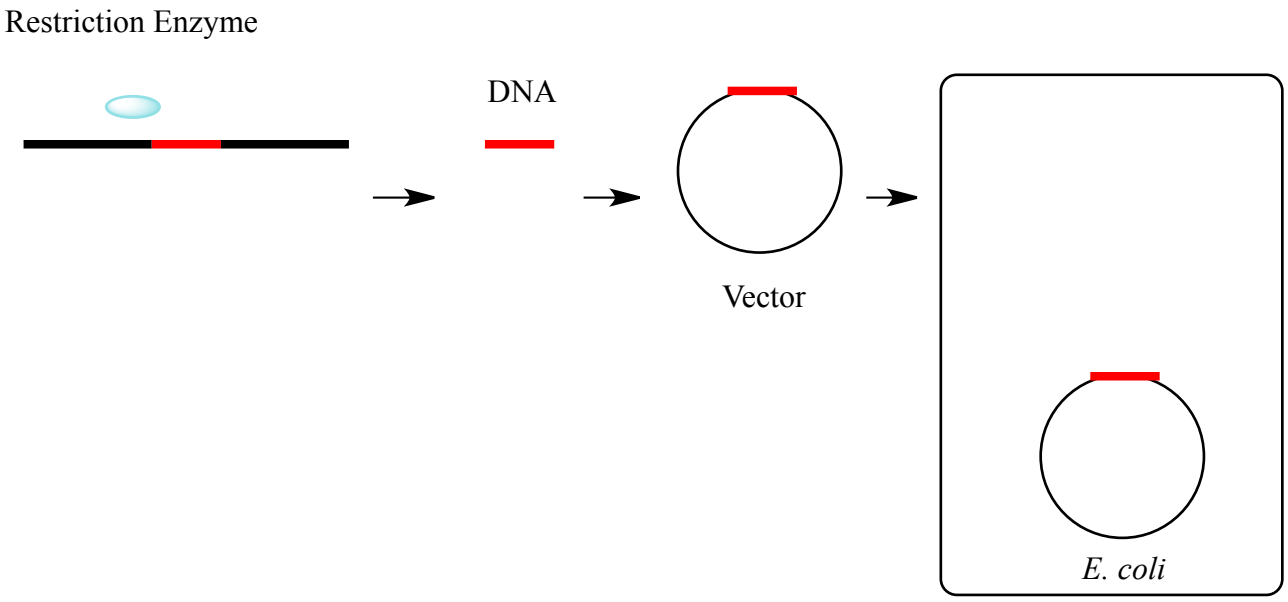
    - A **vector** (**plasmid**) is a small circular DNA molecule that replicates independently of the organism

    - **DNA ligase** is the enzyme responsible for sealing two DNA fragments together

4. Place the vector containing the DNA sequence into an organism or cell (usually *E.coli)*

    - In *E. coli* this allows for large quantities of a specific DNA sequence

**EXAMPLE:**



**PRACTICE:**

1. Which of the following shows the correct order of DNA cloning steps?
    a. DNA extraction → Digestion → Place DNA into *E. coli* → DNA ligase
    b. DNA ligase → Digestion → DNA extraction → Place DNA into *E. coli*
    c. DNA extraction → Digestion → DNA ligase → Place DNA into *E. coli*
    d. Digestion → DNA extraction → DNA ligase → Place DNA into *E. coli*