**CONCEPT:** TRANSPOSABLE ELEMENTS IN PROKARYOTES

● Prokaryotes have two _____ of transposable elements

□ **Insertion sequence (IS) elements** which are short bacterial DNA sequences that jump around genome

- **Transposase** is the protein required for IS movement

- IS contains two main structural features

- Each end contains an **inverted repeated sequence (IR)** required for mobility

- A transposase gene sits between the IRs

**EXAMPLE:** Inverted Repeat

TTACG n n n n n n n n n n n CG TAA

AATGC n n n n n n n n n n n G CATT

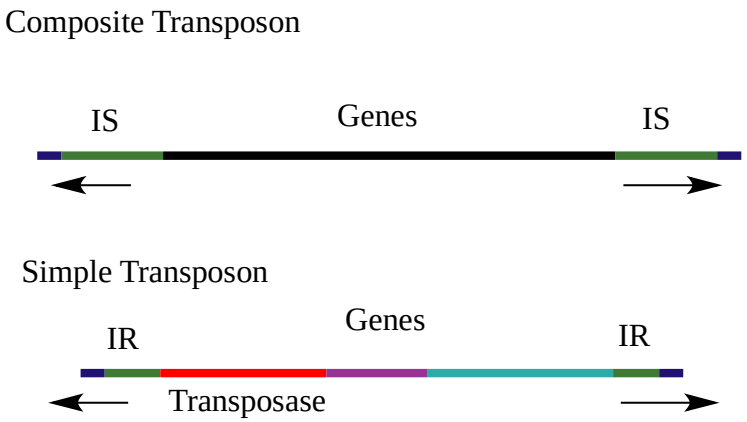
□ **Transposons** are longer DNA sequences that _____ around the genome. There are two types

- **Composite transposons** are flanked by two IS that encode for transposase. Genes sit between IS's

- **Simple transposons** are flanked by IR which surround genes that include transposase

□ Drug resistant genes are transferred between bacterial R plasmids via transposons

**EXAMPLE:**



□ Transposons transpose in _____- main ways

- **Replicative transposition** is when the transposon is copied and the new copy travels to a new location

  - "Copy and paste" method

- **Conservative transposition** is when the transposon is cut out and moved to new location

  - "Cut and paste" method

**EXAMPLE:**

Replicative Transposition

Conservative Transposition

**PRACTICE**:

1. Transposase is a protein that is responsible for what?
    a. Excising a transposable element from a donor site
    b. Insert a transposable element into a target site
    c. Degrading a transposable element that is harming the host genome
    d. Amplifying a transposable element

2. Which of the following transposons do not encode for the transposase enzyme?
    a. Insertion sequence elements
    b. Composite transposons
    c. Simple transposons

3. Which of the following sequences is an example of an inverted repeat sequence that would surround one strand of an insertion sequence element?
    a. 5’ AATCG CGATT
    b. 5’ AATCG AATCG
    c. 5’ AATCG TTAGC
    d. 5’ AATCG GCTAA