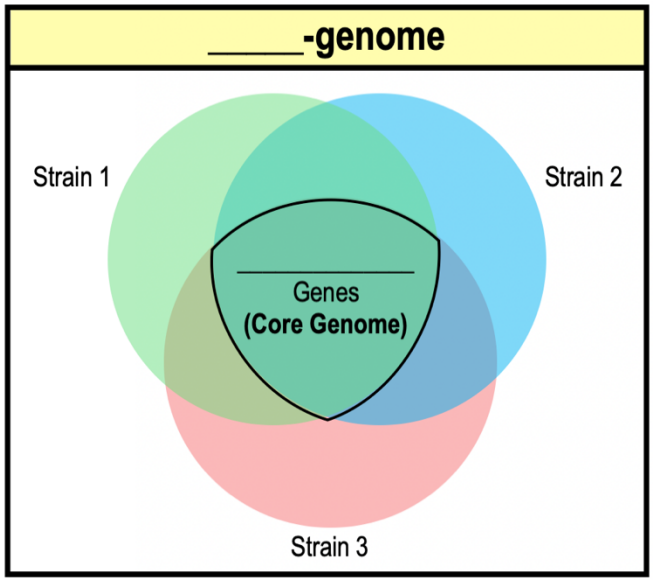
CONCEPT: GENOME VARIABILITY

●Over years scientists have discovered that different strains of a single species have high genome _____.

●The genome of all strains within a species is composed of 2 elements:

1) **Pan-genome:** _____ of the genes in every strain of a species.

2) **Conserved or _____ Genome:** ONLY the genes that are *conserved/shared* by every strain of a species.

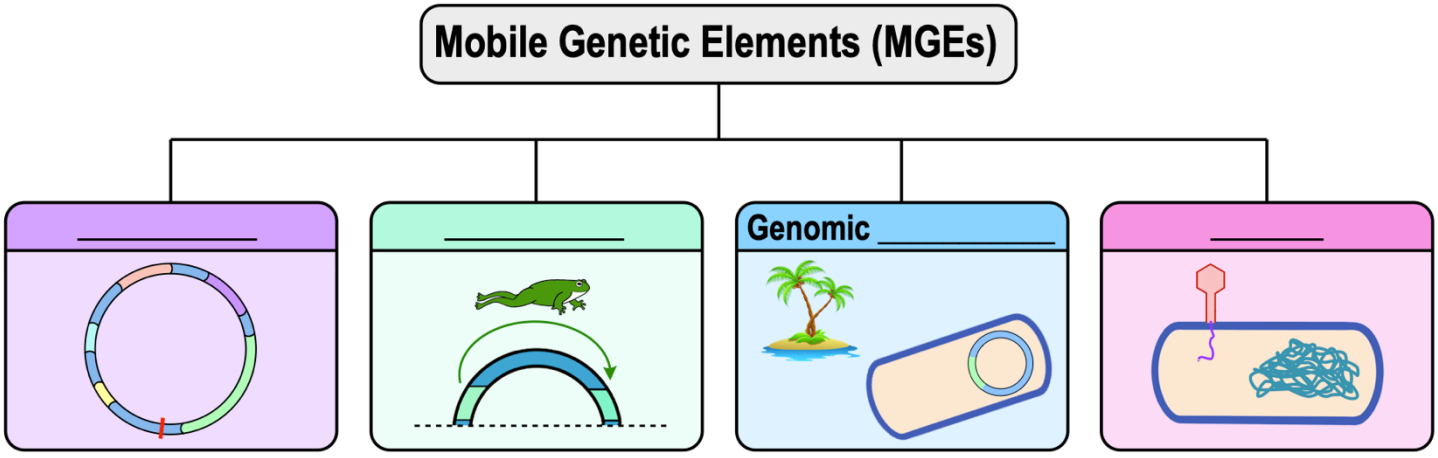


Mobile Genetic Elements Map

●High variability between genomes is significantly attributed to _____ *Genetic Elements.*

□ **Mobile Genetic Elements (MGEs):** segments of DNA that can _____ from one DNA molecule to another.

□ Examples include *plasmids, transposons, genomic islands, & phage DNA.*



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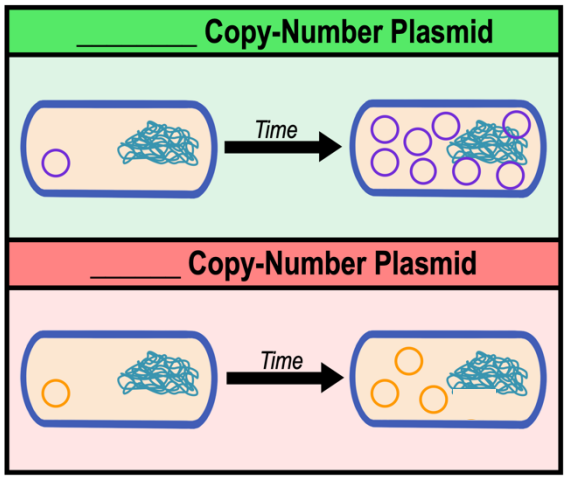
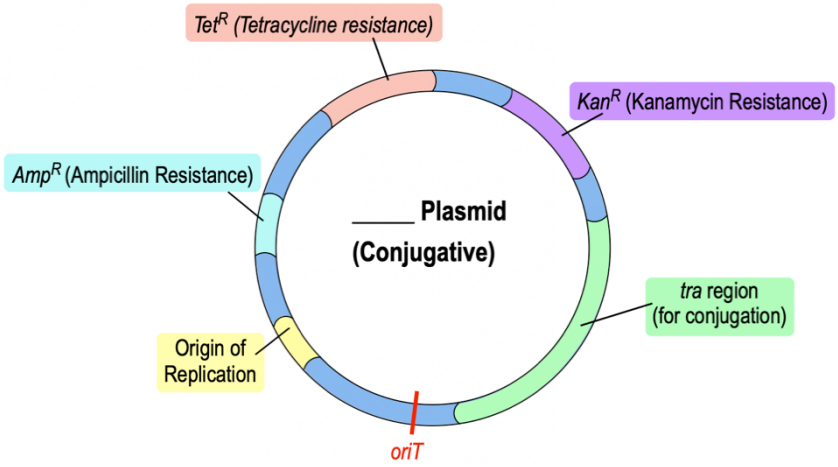
Plasmids

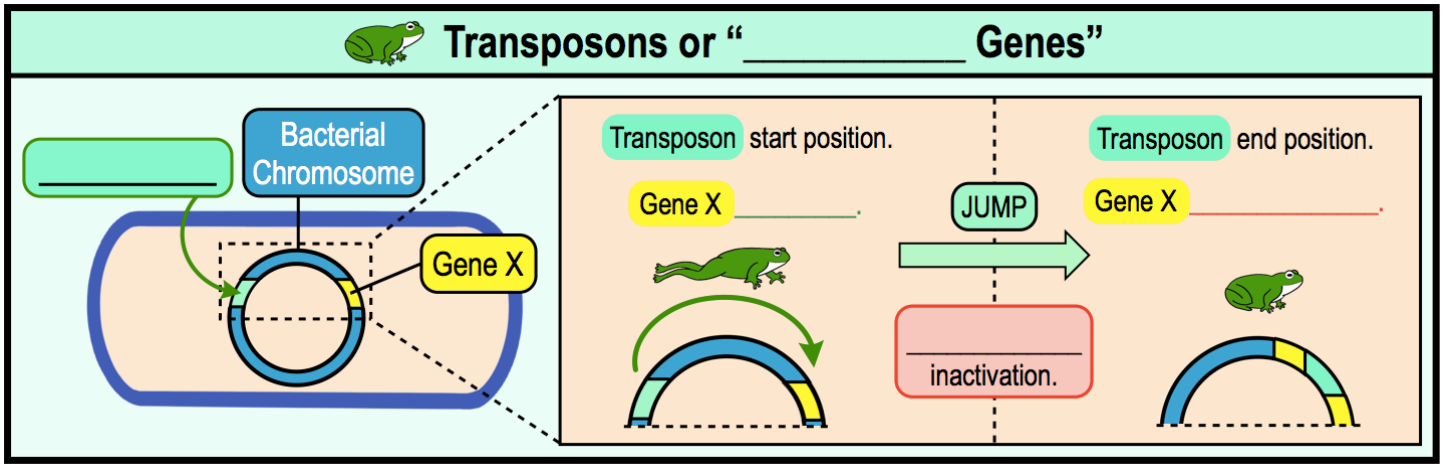
- _____: circular double-stranded DNA molecules with an origin of replication allowing them to replicate in a cell.
  - *High copy-number* plasmids replicate _____ in a cell & *low-copy-number* plasmids replicate _____.
  - Carry various genes, some of which provide cells the ability to _____ a particular environment.
- **Resistance Plasmids (____ Plasmids):** encode genes that confer resistance to antibiotics (R genes).
  - Most are *conjugative* plasmids containing genes required for DNA transfer by conjugation.





Transposons in Prokaryotes

- **Transposons (Jumping Genes):** pieces of DNA that _____ locations in a cell's genome by the process *transposition.*
  - _____: the *movement* of a transposon between locations of a cell's genome.
  - Transposons encode for the enzyme *transposase* which catalyzes the insertion.
  - **Insertional** _____: when the gene that the transposon "jumps" into becomes *inactivated.*



PRACTICE: Transposons encode the enzyme _____ which catalyzes the insertion of the transposon.

a) DNA glycosylase. b) Excisionase. c) Transposase. d) DNA polymerase. e) Integrase.

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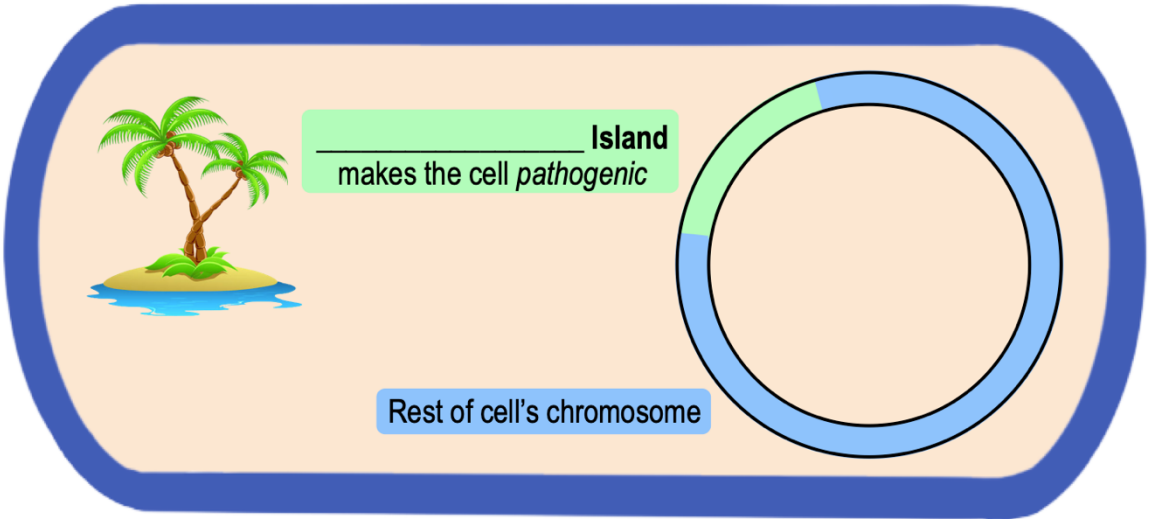
Genomic Islands

- **Genomic** _____**:** large regions of a bacteria's chromosome that originated in a *different* species.
  - □ Identified by a unique ratio of ____-____ base pairs compared to the rest of the chromosome.
  - □ **Pathogenicity Islands:** genomic islands containing genes giving the cell the ability to cause _____.



PRACTICE: Which of the following answers about genomic islands is a true statement?

a) Genomic islands create genetic variability within a species.

b) Genomic islands originated from a different species than the one they currently reside in.

c) Genomic islands can hold pathogenic genes which allows the bacteria they reside in to cause disease.

d) All of the above are true statements about genomic islands.

Phage DNA

- *Recall:* _____ are particles of DNA or RNA surrounded by a protein coat.
  - □ Certain types of phages insert their DNA into a host cell chromosome creating a *prophage*.
  - □ Prophage is replicated along with the remainder of the chromosome & *passed on* to the progeny of cells.