CONCEPT: WORKING WITH MICROORGANISMS

● Bacteria are easy to _____ with in a laboratory setting

□ They are fast dividing, take up little space, and are easily grown in a lab

- **Plating** is when bacteria in a liquid culture is put onto a petri dish containing *agar*

- Plated cells divide, but don't move so they become a clump of cells

- A **colony** is a clump of cells that can be seen with the eye (10^7)

- Generally, these are **clones**, because they are all derived from a single genetic ancestor

□ Bacteria are classified based on what they _____ to grow

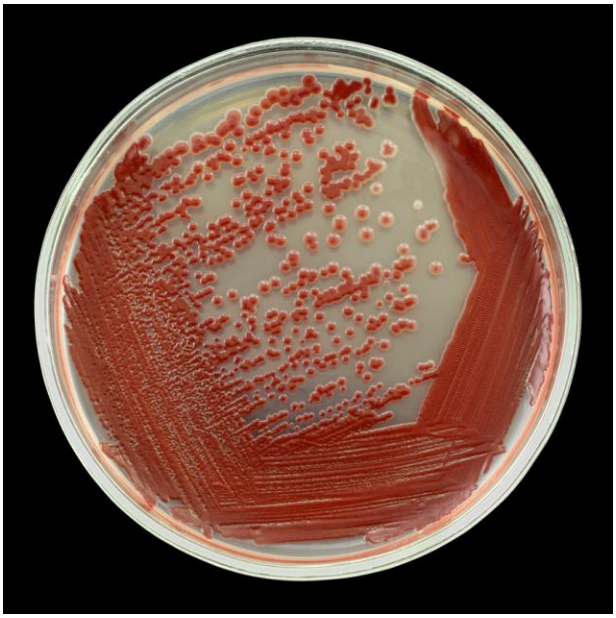
- **Prototrophic** bacteria mean they grow on *minimal medium* (salts, carbon, and water)

- Generally WT, written like *lac*$^+$

- **Auxotropic** bacteria only grow in one or more specific nutrients are present in the media (*complete)*

- Generally mutation, written like *lac*$^-$

EXAMPLE:



● The DNA found in bacteria comes in two sources

□ The bacterial chromosome is the _____ DNA molecule in the bacterium

□ The **plasmid** is a small, circular DNA found in bacteria in addition and outside of the main chromosome

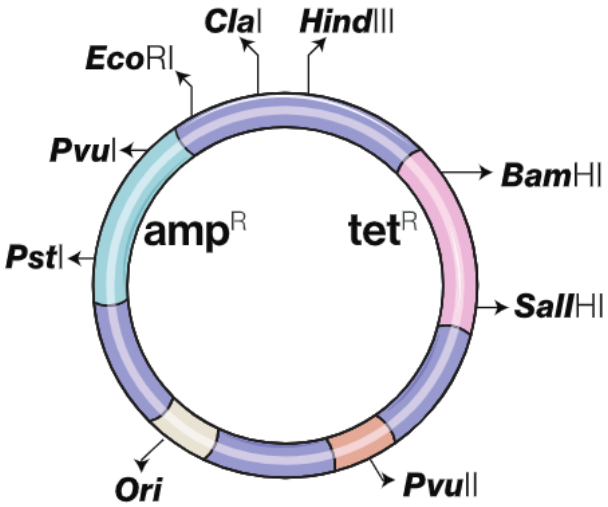
- Contains genes that are not essential to bacteria function

- Plasmids are abundant (*E.coli* has 270 naturally occurring plasmids)

□ Mutations in bacterial DNA can be easily seen phenotypically

- Effect colony morphology, causes *antibiotic resistance*, create auxotrophs, breakdown chemicals

EXAMPLE:



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● Bacterial DNA can be _____ in three main ways

□ **Conjugation** is DNA transfer between contact and fusion of two different bacterial cells

□ **Transformation** is when a bacterium takes up DNA found in the external environment

□ **Transduction** is when phages transfer DNA into the bacterium

● These three are examples of **horizontal transmission** which transfers DNA between individual bacterium

- Differs from **vertical transmission** which transfers DNA through bacterium division

EXAMPLE: