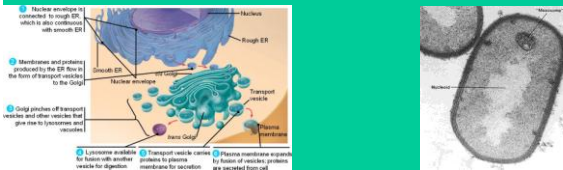
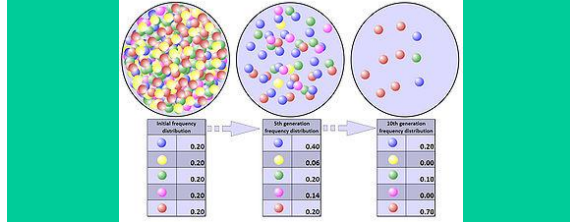


2.11 Origins of Cell Compartmentalization



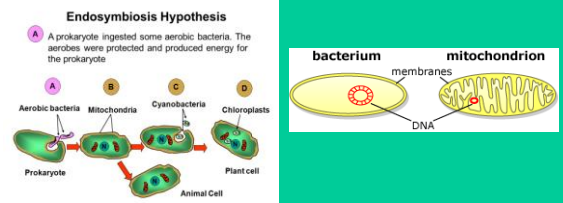
ENDURING UNDERSTANDING

EVO-1 Evolution is characterized by a change in the genetic makeup of a population over time and is supported by multiple lines of evidence.



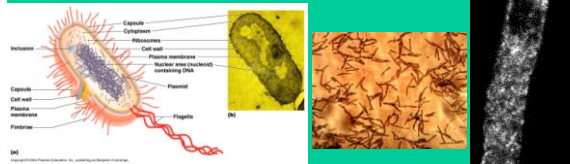
EVO-1.A Describe similarities and/or differences in compartmentalization between prokaryotic and eukaryotic cells.

- Membrane-bound organelles evolved from once free-living prokaryotic cells via endosymbiosis.
 - Mutualism between small aerobic prokaryotes and larger anaerobic prokaryotes
 - Gave rise to mitochondria and chloroplasts



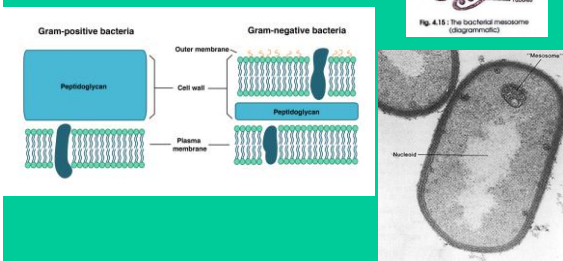
EVO-1.A Describe similarities and/or differences in compartmentalization between prokaryotic and eukaryotic cells.

- Prokaryotes generally lack internal membrane bound organelles but have internal regions with specialized structures and functions
 - Eubacteria and Archaeobacteria
 - Nucleoid Region- Large circular DNA molecule (no nucleus).
 - Plasma membrane- outermost membrane; regulates the entrance and exit of molecules.
 - Plasmids- small accessory rings of DNA
 - Cytoplasm- consists of cytosol, a semi-fluid medium.



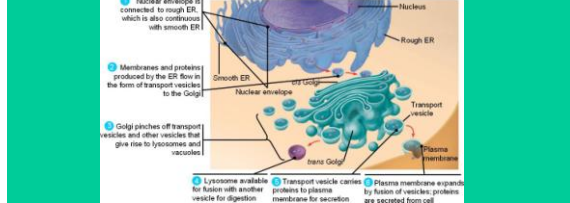
EVO-1.A Describe similarities and/or differences in compartmentalization between prokaryotic and eukaryotic cells.

- Cell wall of peptidoglycan.
- Mesosomes- inward folds of the plasma membrane.



EVO-1.A Describe similarities and/or differences in compartmentalization between prokaryotic and eukaryotic cells.

- Eukaryotic cells maintain internal membranes that partition the cell into specialized regions.
 - Eukaryotic Cells ("true kernel")
 - Similar to prokaryotic cells- contain plasma membrane, cytosol, ribosomes.
 - Endomembrane System



EVO-1.B Describe the relationship between the functions of endosymbiotic organelles and their free-living ancestral counterparts.

- Membrane-bound organelles evolved from previously free-living prokaryotic cells via endosymbiosis.
 - Mitochondria: Aerobic Prokaryote
 - Chloroplast: Photosynthetic Prokaryote
 - Nucleus: Mesosome?

Endosymbiosis Hypothesis

A A prokaryote ingested some aerobic bacteria. The aerobes were protected and produced energy for the prokaryote

