

Bacteria

- Microscopic organisms that are Prokaryotic
 - NO nucleus
 - NO membrane-bound organelles
- Prokaryotes are divided into 2 Domains
 - 1) Eubacteria
 - 2) Archaeobacteria

Eubacteria

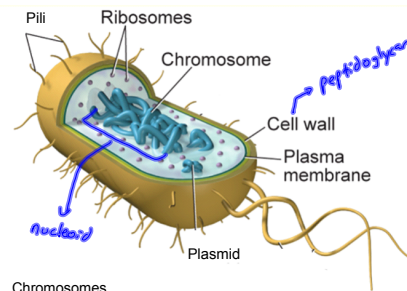
- What we are thinking of when we think bacteria
- The most studied organisms on earth
- Found almost everywhere (except extreme environments)
- Very strong cell walls that contain peptidoglycan

Archaeobacteria

- bacteria that can live in extreme environments
 - ★ Thermophilic - live in very hot and acidic places
 - ex. sulfur hot springs, thermal ocean vents, volcanoes
 - ★ Halophiles - live in very Salty environments
 - ex. Great Salt Lake, Dead Sea
 - ★ Methanogens - cannot live in the presence of Oxygen
 - use CO₂ and give off methane gas as waste
 - ex. sewage plants, swamps, bogs, intestinal tracts (responsible for gas production)

Prokaryote Structure

- microscopic, unicellular
- contain DNA and ribosomes, but do not have a nucleus or other organelles



Chromosomes

- genes are found on a large circular chromosome in an area of the cell called the nucleoid

Capsule

- a layer that forms around the cell wall
- has many functions
 - keeps cell from drying out
 - helps cell attach to different surfaces
 - shelters cell from effects of antibiotics

Pili

- hair-like structures that are made of protein
- help cell attach to surfaces

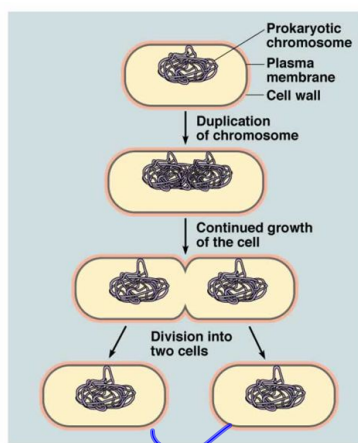
Flagella

- help the prokaryotes move by whipping tail back and forth

Prokaryote Reproduction

- Most prokaryotes reproduce by asexual reproduction called binary fission
 - ↳ 1 parent

The division of a cell into 2 genetically identical cells



Shapes of Bacteria

3 General Shapes

- 1) COCCI - spherical or round

Coccus



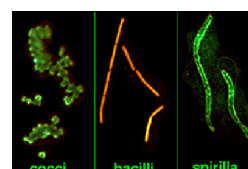
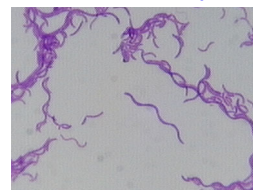
- 2) BACILLI - rod shaped

Bacillus



- 3) SPIRILLI - spiral shaped

Spirillus



Gram Staining

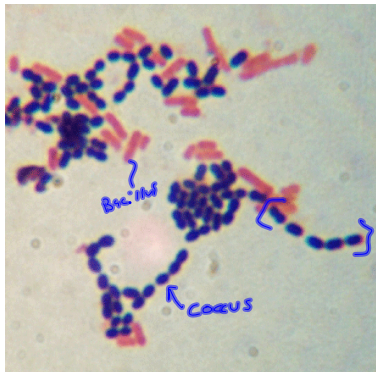
- Bacterial cell walls are made of a substance called peptidoglycan
- Scientists can add dyes to bacteria to determine how much peptidoglycan is present in the cell wall. This process is called Gram Staining

GRAM + → appear dark purple after staining

- this means there is a lot of peptidoglycan present

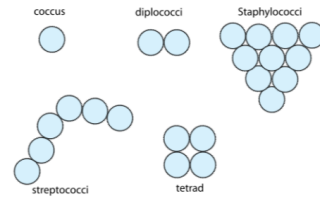
GRAM - → appear pink after staining

- this means there is not much peptidoglycan present



Bacterial Arrangements

Arrangements of Cocci



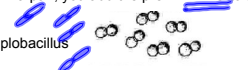
- If the bacteria appear by themselves you just call them by their shape

ex. cocci, bacilli, spirilli



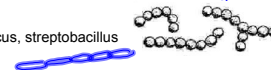
- If the bacteria appear in a pair, you add the prefix DIPLO to the shape name

ex. diplococcus, diplobacillus



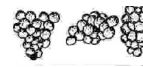
- If the bacteria appear as a chain, you add the prefix STREPTO to the shape name

ex. streptococcus, streptobacillus

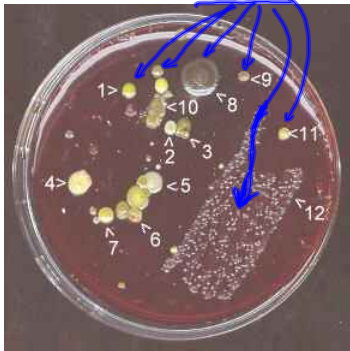


- If the bacteria appear in a clump or cluster, add the prefix STAPHLO to the shape name

ex. staphylococcus, staphylobacillus



Bacterial Colonies



Colony Shape

Punctiform
(under 1 mm diameter)



Round



Filamentous



Irregular



Colony Edge Shape

Smooth
(entire)



Curled



Wavy



Lobate



Filamentous



Colony Elevation

Elevation



Raised

Convex

Flat

Umbonate

Crateriform