

Name: _____

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Block: _____

CHARACTERISTICS OF BACTERIA (Chapter 17.2)

GROUPS OF MONERANS

Prokaryotes

- Before: All prokaryotes were placed in Kingdom Monera.
- Currently split into two kingdoms:
 - Kingdom Archaea
 - Kingdom Eubacteria

Archaeobacteria	Eubacteria
<ul style="list-style-type: none"> • Live in harsh environments <ul style="list-style-type: none"> ◦ <u>No oxygen</u> ◦ <u>High temperatures</u> ◦ <u>High salt concentrations</u> • Major differences <ul style="list-style-type: none"> ◦ <u>Absence</u> of peptidoglycan in the cell wall 	<ul style="list-style-type: none"> • Wide range of organisms • Live almost <u>everywhere</u> <ul style="list-style-type: none"> ◦ Fresh water, salt water, land, human body • <u>Contain</u> peptidoglycan in cell wall

CHARACTERISTICS OF BACTERIA




Identifying prokaryotes

Bacteria are prokaryotes classified based on:

1. Cell Shape
2. Cell Wall
3. Obtaining energy
4. Energy release

(1) Cell Shape





(a) There are 3 basic shapes:





- Cocci** - sphere shape 
- Bacillus** - rod shape 
- Spirillum** - spiral shape 



(b) Bacteria arrangements may include: (some cells stick together in colonies)

- Diplo**- colonies of 2
- Staphylo**- large clumps. Example: Staphylococcus
- Strepto**- long chains. Example: Streptococcus

Drawings of the different shapes:

-  Coccus
-  Diplococcus
-  Streptococcus
-  Staphylococcus

-  bacillus
-  Diplobacillus
-  Streptobacillus
-  Staphylobacillus

-  spirillum
-  Diplospirillum
- ⋮

(2) Cell Wall

- The chemical nature of bacterial cell walls can be studied by a method called

gram staining

1. Gram Positive

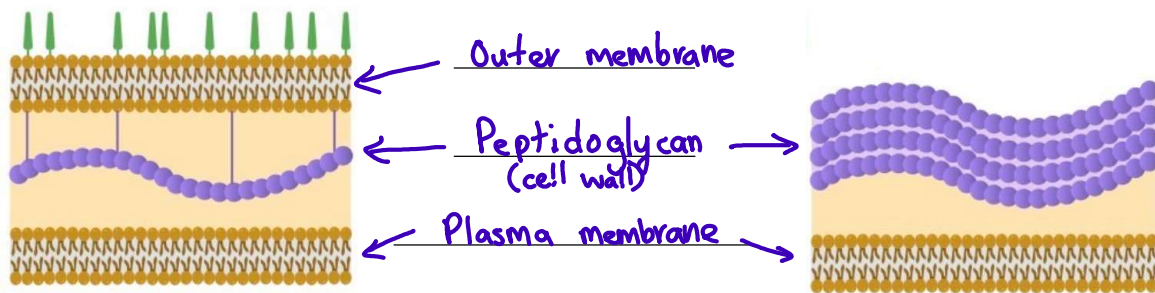
- Cell wall made of protein and sugar.
- Turns purple after gram staining.
 - Thick wall retains stain.

2. Gram Negative

- Extra layer of lipid outside of cell wall
- Turn pink after gram staining
 - Thin wall does not retain stain
- Require different types of antibiotics to treat infections

Gram Negative ⊖

Gram Positive ⊕



(3) Obtaining Energy

- The four groups are:

a) Autotrophs – self feeding, make own nutrients.

- Photoautotrophs trap energy from the sun to produce food. Eg. Plants
- Chemoautotrophs obtain energy from inorganic molecules such as sulfur, iron, nitrites and hydrogen sulfide.

b) Heterotrophs – feed on other organisms.

- Photoheterotrophs use sunlight for energy AND also need organic molecules.
- Chemoheterotrophs obtain energy by breaking down and absorbing organic molecules. Eg. Humans

Question: What type of nutrition do humans use? Chemoheterotrophs

(4) ~~Energy Release~~ Living Conditions

a. Aerobic – use oxygen and the breakdown of food molecules in a process called respiration.

b. Anaerobics – DO NOT use oxygen. They rely on a less efficient process called fermentation to obtain their energy.

- Obligate **aerobes** cannot survive without oxygen.
- Facultative **anaerobes** do not require oxygen but aren't poisoned by it either.
- Obligate anaerobes – oxygen will kill them.