

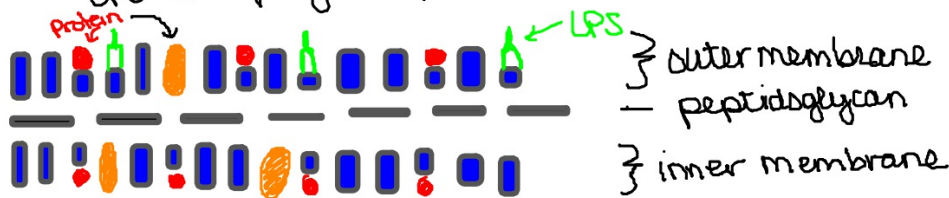
3/4 Bacterial Cell Structure

Cell wall protect cells against osmotic shock + physical damage
it also confers rigidity + the shape of the cell

Shapes:
rods (bacillus) cocci spiral "globular" oval

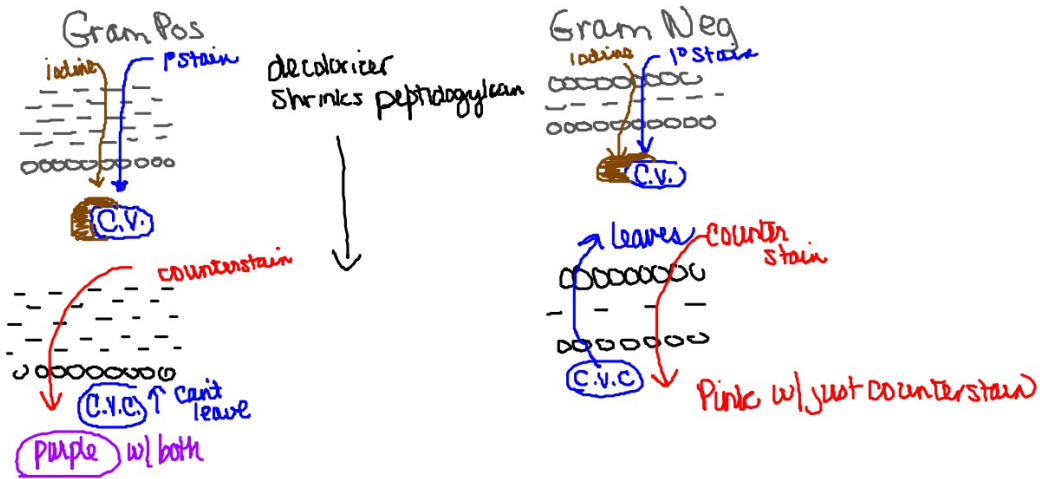
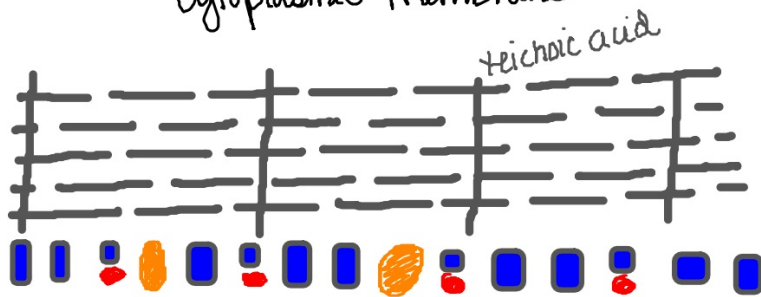
Gram Negative

thin layer of peptidoglycan - surrounded by two membranes.
the cell membranes contain lipids, lipoproteins and large molecules called lipopolysaccharides (LPS).
LPS can play a protective role + act as an endotoxin.




Gram Positive

Consists of a thick layer of peptidoglycan + only an inner cytoplasmic membrane



Chromosome contains genome



Chromosome

plasmid

plasmid Contains supplemental genetic information information such as resistance to antibiotics, production of toxins and tolerance to harsh environments.

pili Short thin hairlike structures (straws)
Function is 2 fold — ① adhesion to surface
② transfer of genetic material between cells.

glycocalyx assist cells in adhesion to solid surfaces + protect against the host's immune system (stable capsule)

fimbriae more abundant than pili — adhesion to surfaces and formation pellicles (biofilms) containing thin sheets of cells on a liquid surface

flagella

movement of cells - motility of most bacteria is away from or toward a stimulus.

- Chemotaxis: chemical stimuli
- phototaxis: light stimuli
- magnetotaxis: movement along the Earth's magnetic field. Occurs in bacteria that contain magnetosomes including iron.

Types of Distribution

- monotrichous - one flagellum, if it originates at the end of the cell it is called a polar flagellum.



- peritrichous - flagella surround the cell. Bundled peritrichous flagella give rise to slower forward motion than polar.
- amphitrichous - groups of flagella at both ends of the cell
- Lophotrichous - two or more at one end.

Endospore - heat resistant and non-growing structure,
can retain its viability over long periods of time
under harsh conditions

- exosporium outermost layer (protein)
- spore coat several layers of spore-specific proteins
- cortex loosely cross-linked peptidoglycan
- core bacterium

Archaea - lack peptidoglycan, tend to live in harsh environments

- Methanogens - produce methane as a result of respiration
- Halophiles - live in areas of extreme salinity
- Thermophiles - live in extremely hot water
- Barophiles - live in areas of extreme pressure
- others can survive in extreme pHs.