

# BACTERIAL CELL STRUCTURE

**Most common shapes are coccus (sphere); bacillus (rod); or spiral (spirochete)**

**Most common arrangements are single; chains (strepto); or clusters (staph)**

## **Flagella:**

- Motorized engine that twirls around—fuel is ATP
- Unique components are called H antigens (e.g. *E.coli* 0157:H7)
- Some bacteria have numerous flagella (peritrichous)—examples include *E.coli* and *Proteus*

## **Fimbriae:**

- These multiple short hairs help bacteria attach to our body surfaces, especially in our mucus membranes—e.g. *Neisseria gonorrhoea* adheres to reproductive tract with its fimbriae;
- Also critical in keeping good bacteria (nonpathogenic *E.coli* and *Lactobacillus*) in our gut

## **Pili:**

- Sexual recombination: Allow bacteria of all different types to bind together and transfer plasmids (containing genes for antibiotic resistance and other traits).

## **Cell Membrane:**

- Made of phospholipids.
- Alcohol and ammonia disrupt cell membrane and cause bacterial damage.
- In bacteria, contain enzymes that pass electrons and then use that energy to make ATP.
- Regulates entry of nutrients/exports extracellular enzymes and toxins
  - Common source of antibiotic resistance is the presence of transporters that also pump the antibiotic out of the cell so the antibiotic can't inhibit cell function (usually in this case, the drug should inhibit protein synthesis but is getting pumped out before it can do that!)

## **Ribosomes:**

- Make protein by translating mRNA into amino acids. The ribosomes also form the link between amino acids to complete the protein.
- Aminoglycoside antibiotics block the ribosomes from its work. Examples include gentamicin and streptomycin.
  - Aminoglycoside antibiotics can cause hearing damage (8<sup>th</sup> cranial nerve) and kidney damage. Serum creatinine is a key indicator of kidney health and is monitored while on these antibiotics.

## **Inclusions:**

- Storage vesicles for nutrients