Bacteria and Viruses

Chapter 18

Diversity of Prokaryotes

* Remember that there are two types of cells:
  * Eukaryotes - nucleus
  * Prokaryotes – no nucleus
* Prokaryotes are the most numerous organism on Earth
* Prokaryotes are divided into two domains:
  * Bacteria
  * Archaea

Bacteria and Archaea

* **Bacteria**
* Most studied organisms
* Found almost everywhere
* Strong cell walls
* Can possibly make their own food

* **Archaea**
* Live in hostile environments
  * Hot, acidic areas
  * Areas with no oxygen
  * Very salty areas
  * Sewage and swamps

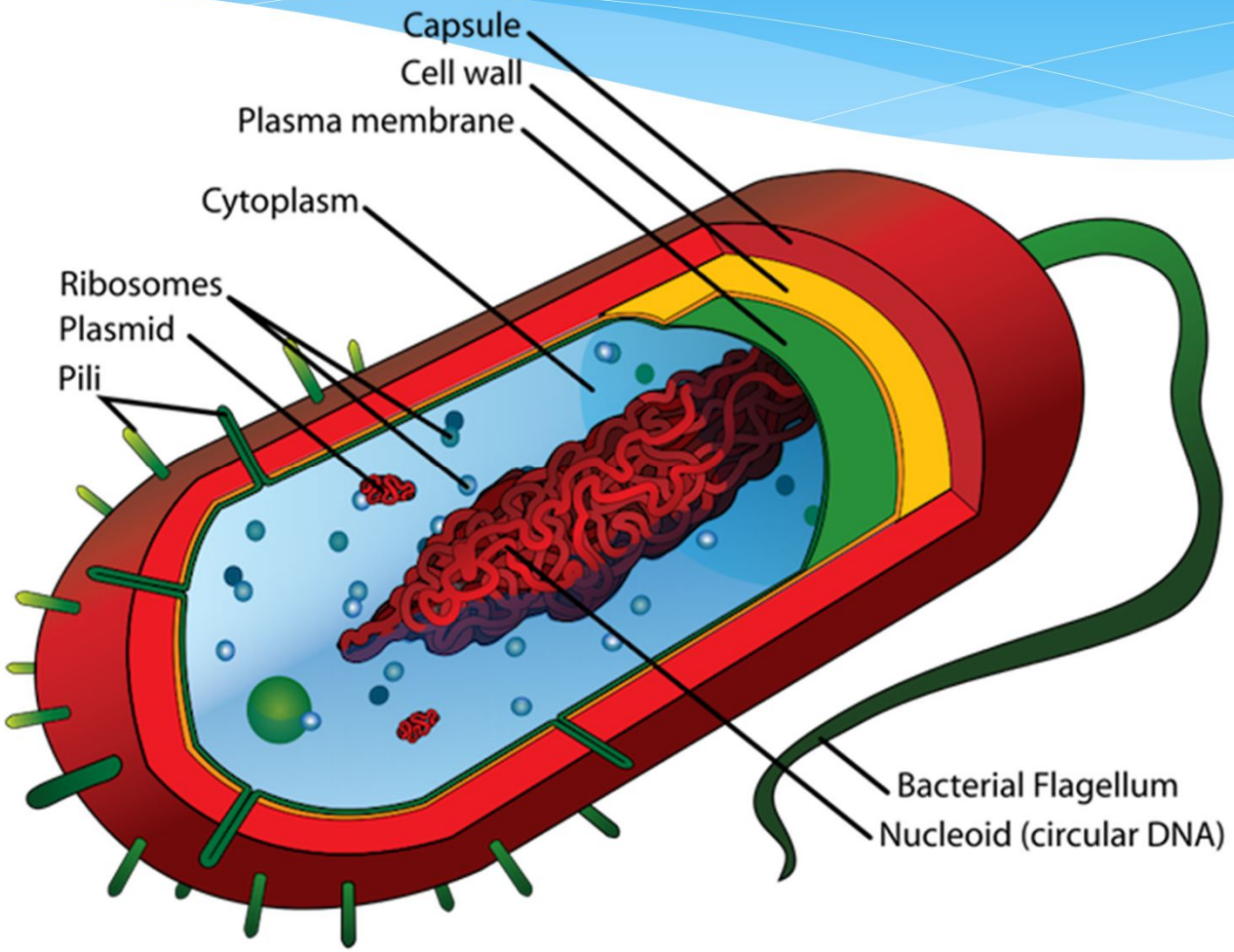
Prokaryote Structure

* Unicellular
* Contain DNA and ribosomes
* Genes are found in the nucleoid
  * Large, circular chromosome
  * Also contain a smaller piece called a plasmid
* Some contain a capsule
  * Polysaccharide outer coating
  * Protective layer

Prokaryote Structure

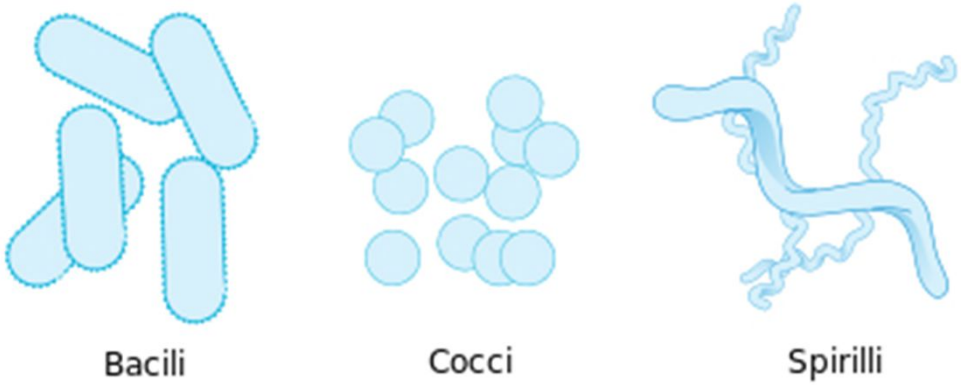
* Pili are found on the outside of the cell
  * Hairlike projections made of protein
  * Help to attach to surfaces
  * Can send copies of genes to other cells
  * Key part in transferring antibiotic resistance
* Very small in size
  * Nutrients can diffuse easily and quickly

Prokaryote Structure



Prokaryote Characteristics

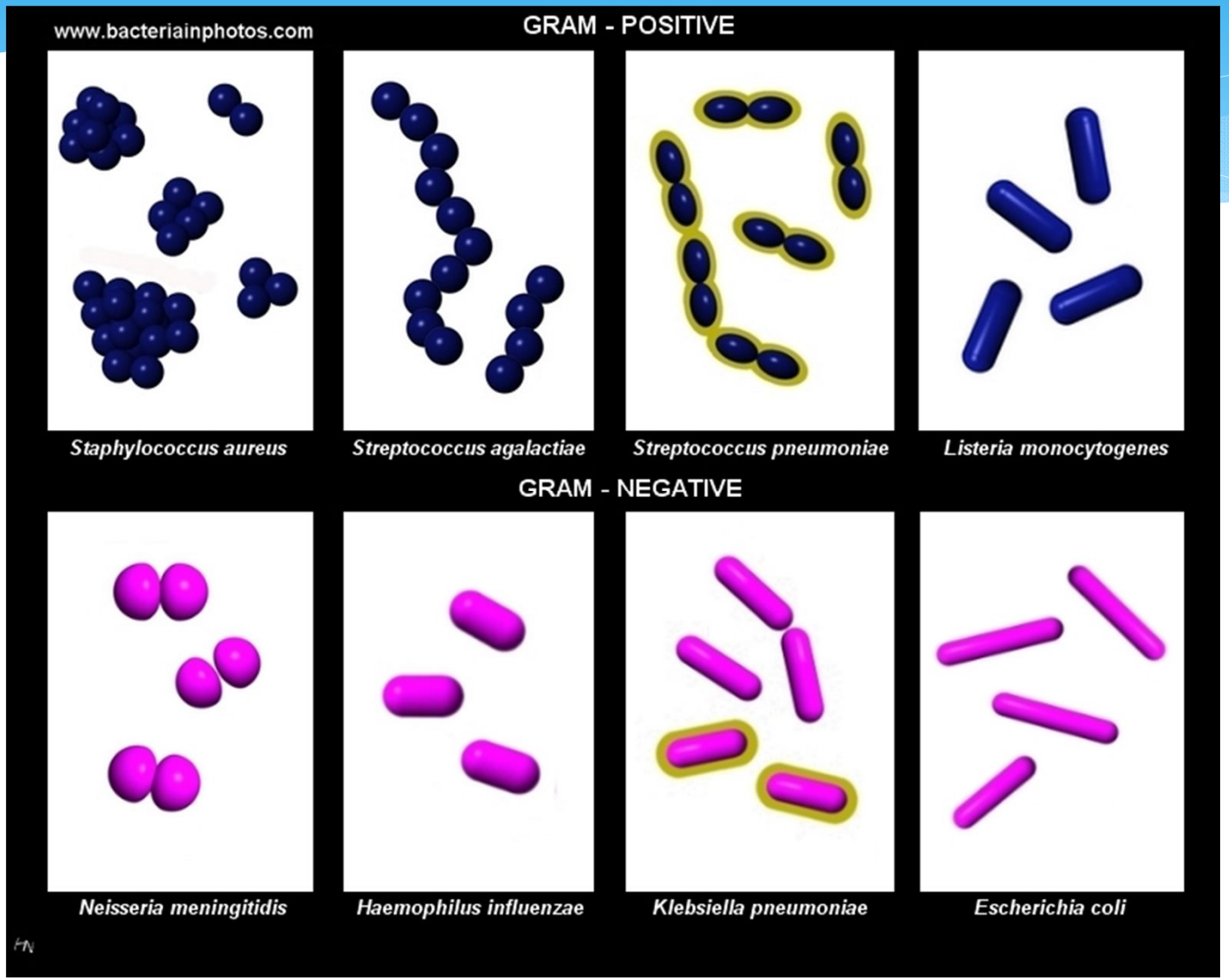
* Usually identified by shape, cell wall and movement
* Three general shapes:
  * Cocci – spherical or round
  * Bacilli – rod shaped
  * Spirilli – spiral shaped



Prokaryote Characteristics

* Classified by cell wall composition
  * All contain peptidoglycan – a sugar substance
  * Some have an outer lipid layer as well
  * When stained – some will turned colors
  * Those with lipid layer turn light pink, without a layer turn purple
  * Antibiotics can attack the cell wall – important to know what kind is present

Prokaryote Characteristics



Common bacterial disease

Whooping cough	Tuberculosis	Anthrax	Acne	Boils
Infected wounds/burns	Gastroenteritis	Food poisoning	Cholera	Botulism
Tetanus	Bacterial meningitis	Lyme disease	Typhoid fever	Syphilis
Gonorrhea	Chlamydia	Strep throat	pneumonia	