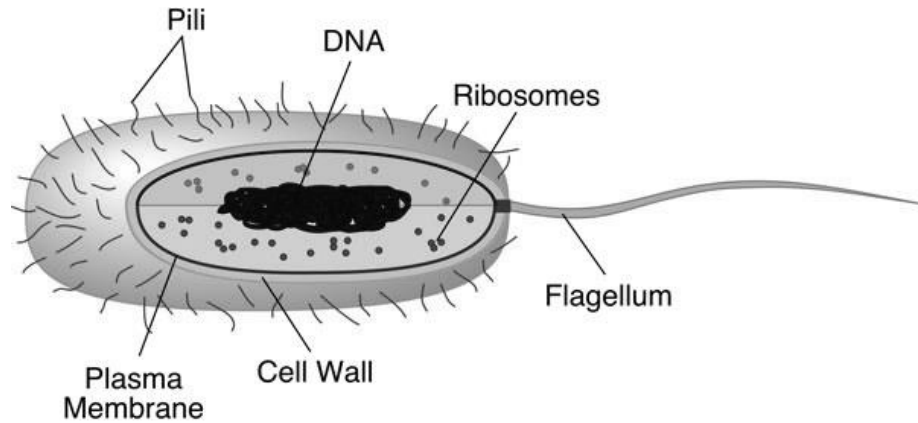


Cell Comparison

Prokaryotes -NO Nucleus



Prokaryotes, which include bacteria, are the simplest of all the cells. All prokaryotes have DNA. They also have ribosomes to make proteins. *They do NOT have a nucleus* or “membrane-bound” organelles (organelles surrounded by a membrane). They are surrounded by a cell membrane and a cell wall. All bacteria are prokaryotes and all prokaryotes are bacteria. They are found everywhere. They are thought to be some of the oldest life forms on earth.

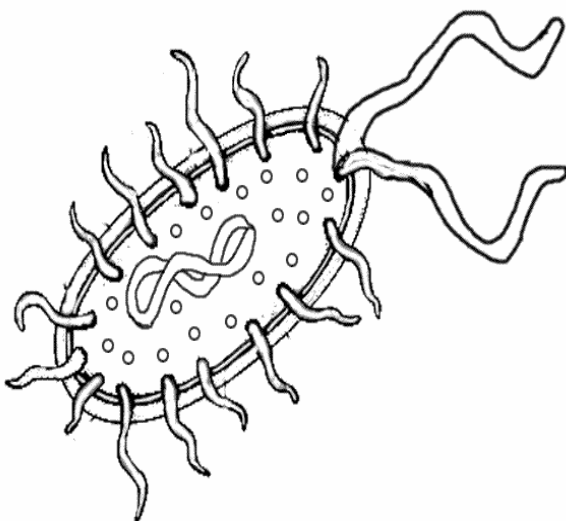
1. What 3 characteristics do all prokaryotes have in common? _____

2. What living organisms are prokaryotes and where can they be found?

3. What structure is NOT in prokaryotes?

Bacteria are unicellular and are covered with a thick outer **cell wall**. **Color and label the cell wall PURPLE**. Just within the cell wall is the cell membrane (also called the plasma membrane). **Color and label the cell membrane PINK**. Along the surface of some bacteria are structures called **pili (pilus-singular)** that help bacteria adhere to surfaces. **Color and label all the pili LIGHT GREEN**. Some bacteria are **motile** (can move). Many of these bacteria have long, whip like structures called **flagella (flagellum-singular)**. **Color and label the flagella DARK GREEN**. Since

bacteria are prokaryotes, they do **NOT** have a nucleus. They do have a single circular strand of **DNA** (double helix), their chromosome is in a circular shape in the **nucleoid region** (center of the cell). This single strand of DNA contains all the instructions for making more bacterial cells. Locate the **DNA** and **color and label it YELLOW**. The inside of the bacterial cell is filled with cytoplasm. **Color and label the cytoplasm LIGHT BLUE**. Sprinkled throughout the cytoplasm of the cell are small, round structures called **ribosomes**. Ribosomes make proteins for the cell. **Label and Color all of the ribosomes RED**.



4. What covers the outside of all prokaryotes?

5. What structures, if present, let bacteria be motile?

6. Describe the Chromosome (DNA) of bacteria & tell its location. _____

7. What is the purpose of ribosomes?

Eukaryotes EU – DO have Nucleus

Eukaryotic cells are more complex than prokaryotic cells. Eukaryotes and prokaryotes both have a cell membrane, ribosomes and DNA. However, the DNA of eukaryotic cells does not float freely in the cytoplasm. Instead, it is a linear structure found in the **nucleus**, an internal compartment bound by a cell membrane. The nucleus is one kind of organelle found in eukaryotic cells.

Organelles are structures that perform specific functions (like tiny organs in your body). Most organelles are surrounded by a membrane (**membrane bound**). Ribosomes are one organelle that is not membrane bound.

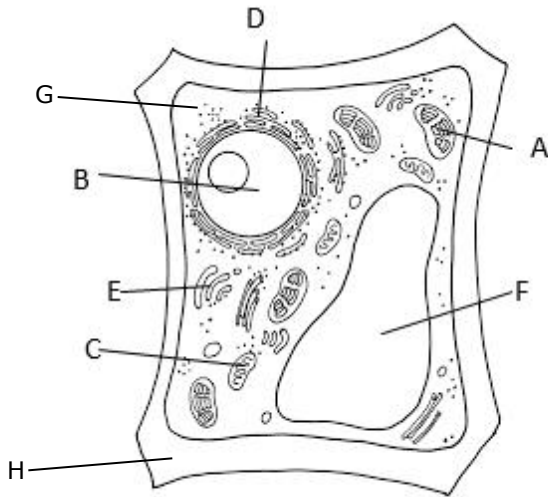
Eukaryotes are organisms made of one or more eukaryotic cells. The earliest eukaryotes, like the first prokaryotes, were single-celled organisms. They arose about 1 billion years later than the earliest prokaryotes. Later, multicellular eukaryotes arose. Every type of multicellular organism that exists is made up of eukaryotic cells. The only living organisms that are not eukaryotes are bacteria (they are prokaryotes).

8. What are the organelles in eukaryotes surrounded (bounded) by that is not seen in prokaryotes?

9. What main organelle is found in eukaryotes but not prokaryotes?

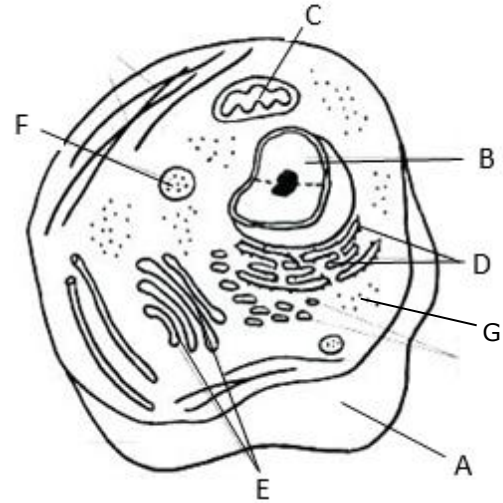
10. What type of cells are all multicellular organisms?

11. What organelles are found in BOTH prokaryotes and eukaryotes? _____



PLANT CELL!

- A Chloroplast** – makes energy
- B Nucleus** – contains DNA
- C Mitochondria** – makes energy
- D Endoplasmic reticulum** – transports proteins
- E Golgi** – packages and delivers proteins
- F Vacuole** – stores water and salts
- G Ribosomes** – make proteins
- H Cell Wall** – provides support and structure



ANIMAL CELL!

- A Cell Membrane** – allows things into & out of cell
- B Nucleus** – contains DNA
- C Mitochondria** – makes energy
- D Endoplasmic reticulum** – transports proteins
- E Golgi** – packages and delivers proteins
- F Lysosome** – uses enzymes to clean the cell
- G Ribosomes** – make proteins

Color the organelles of the eukaryotic plant and animal cells above. Color the (A) **chloroplast** green, the (B) **nucleus** red, the (C) **mitochondria** blue, the (D) **endoplasmic reticulum** orange, the (E) **Golgi** yellow, the (F) **large vacuole** brown, the (G) **ribosomes**, draw a purple square around some **ribosomes**, and the (H) **Cell Wall** pink.

12. Which 3 of the above organelles are in plant cells, but not animal cells?

13. What 3 organelles are involved in the building and distributing of ribosomes?
