

TOPIC: INTRODUCTION TO PROKARYOTES




Prokaryotic and Eukaryotic Cells

- _____ karyotic & _____ karyotic are the *broadest & most distinct groupings of all life*.

1) **Prokaryotic Cells:** do _____ have a *nucleus* (includes both _____ & _____).

2) **Eukaryotic Cells:** do have a _____ & other membrane-bound *organelles*.

EXAMPLE: Prokaryotic & Eukaryotic Cells.

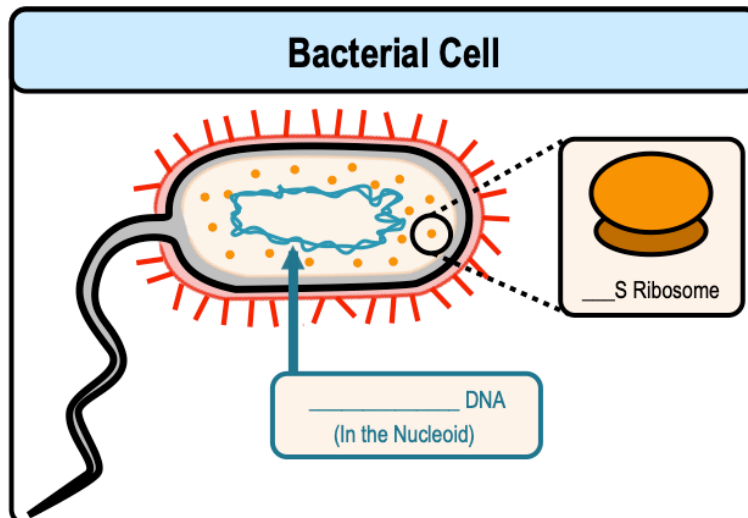
Domains of Life	Cell Type	Nucleus	Organelles	Cell Size	Cellularity
Bacteria	 Prokaryotic	_____	Absent	Small 1µm	_____ cellular
Archaea	 _____	Absent	_____	Small 1µm	Unicellular
Eukarya	 Eukaryotic	_____	Present	LARGE 100µm	Unicellular or _____ cellular

PRACTICE: Which domains of life are classified as prokaryotes?

- a) Bacteria & Eukarya. b) Archaea & Fungi. c) Bacteria & Archaea. d) Bacteria & Protista.

Features of Bacterial Cells

- _____ are the most abundant & diverse organism on Earth.
- ☐ Bacterial DNA is _____ in shape & found in a region called the _____.
- ☐ Bacteria have small (____S) *ribosomes* & divide by _____ *fission*.





TOPIC: INTRODUCTION TO PROKARYOTES

PRACTICE: In bacteria, DNA will be found in _____.

- a) A membrane-enclosed nucleus. b) Mitochondria. c) The nucleoid. d) Ribosomes.

Recap: Prokaryotic vs. Eukaryotic Cells

● Prokaryotic & Eukaryotic cells have _____ key differences:

<u>Prokaryotic Cells</u> 	<u>BOTH</u>	<u>Eukaryotic Cells</u> 
1. ____ Nucleus		1. Has a Nucleus
2. Size: Smaller (1-10 μm)	Have a Cell Membrane	2. Size: Larger (10-100 μm)
3. Less Complex	Contain the major Biomolecules:	3. More Complex
4. Only ____ cellular	- Carbohydrates	4. Unicellular or ____ cellular
5. ____ DNA	- Proteins	5. Linear DNA
6. ____ membrane-bound organelles	- Nucleic Acids	6. Has membrane-bound organelles
7. Cell Division: Binary Fission	- Lipids	7. Cell Division: _____
8. Small ____ Ribosomes		8. Larger 80S Ribosomes

PRACTICE: Which of the following is/are a primary difference(s) between all prokaryotes and eukaryotic cells?

- a) Prokaryotes have DNA that floats freely in the cytoplasm.
b) Prokaryotes are significantly smaller than eukaryotic cells.
c) Prokaryotes do not have ribosomes like eukaryotic cells.
d) a and b.
e) a, b, and c

PRACTICE: Which of the following is not a common feature shared by all types of cells?

- a) Contains DNA as the genetic material.
b) Contains a protective cell wall or cell membrane.
c) Contains a fluid-like portion called the cytoplasm.
d) Contains a nucleus that stores the genetic material.

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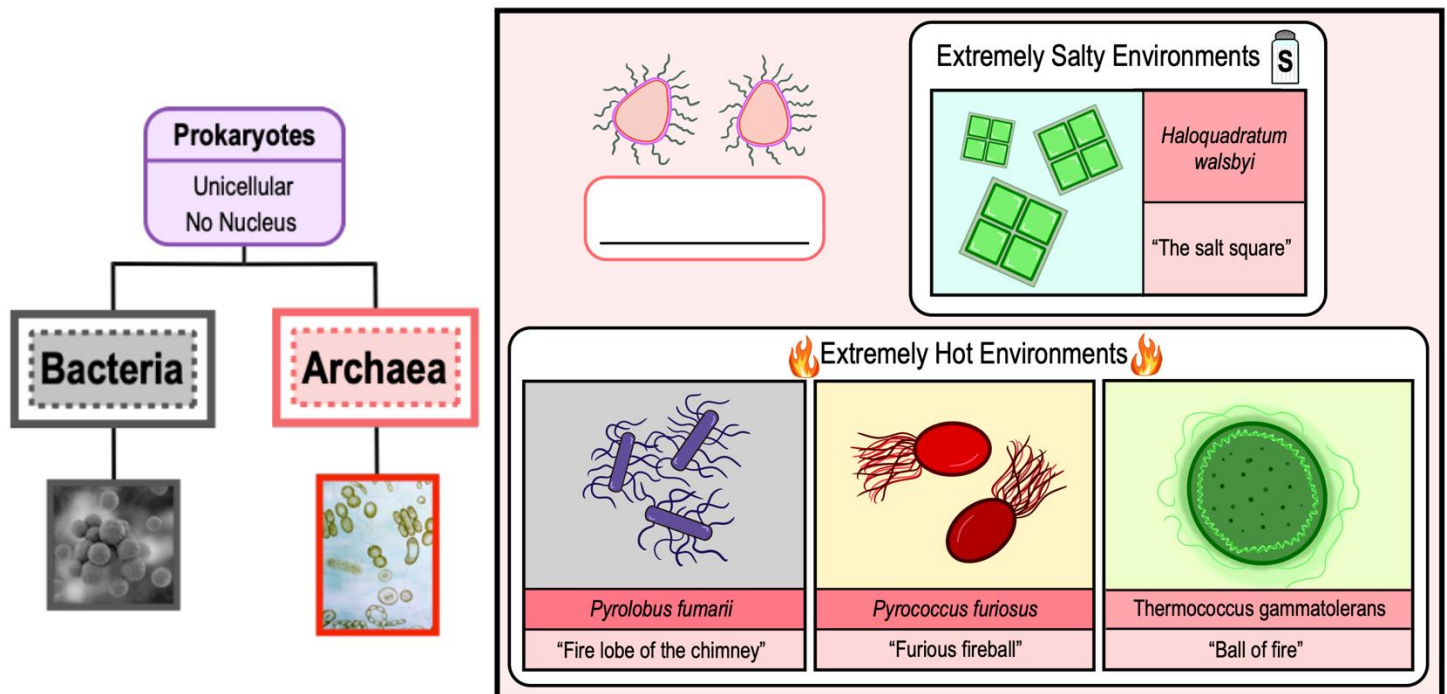
PRACTICE: You isolate a cell with the following characteristics: (1) no nucleus, (2) a cell wall, and the cell is (3) 2 μm in size. This cell could be a/an:

- a) Bacterium.
- b) Plant cell.
- c) Animal cell.
- d) Bacterial cell or a plant cell.
- e) Plant cell or an animal cell.

Introduction to Archaea

- _____ (singular: *archaeon*): organisms in one of the three domains of life.
 - ☐ Like Bacteria, Archaea also have a _____ karyotic cell structure, but they still have many *differences*.
 - ☐ Archaea have unique ribosomal RNA (rRNA) sequences & have cell walls that _____ peptidoglycan.
 - ☐ Well known for growing in _____ environments (*extremophiles*) but also grow in moderate environments.

EXAMPLE: Introduction to Archaea.



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PRACTICE: Many species of Archaea are known to thrive in environments in which most living things would not survive.

We call these Archaea...

- a) Extremophiles.
- b) Thermophiles.
- c) Halophiles.
- d) Acidophiles.
- e) Alkaliphiles.

PRACTICE: If you wanted to increase your chances of obtaining a member of Archaea (rather than a member of another domain), which would be the best site to obtain a sample?

- a) Inside a human intestine.
- b) On the surface of human skin.
- c) A 95°C (203°F) hot spring in Yellowstone.
- d) A 22°C (72°F) freshwater spring in Hawaii.
- e) On the surface of a raw hamburger patty.