NOTES 2.2

Chapter 2 - Cell Structure and Function
Lesson 2 - The Cell

All things that live are made from cells. You can't see them, but every part of your body, including everything inside your body, is made from cells. Cells eat, they grow, and they make more of themselves (what scientists call replicate).

There are millions of different types of cells. Dog cells are different from fish cells. Bird cells are different from your cells. And inside your body, there are many different cells, each one doing a different job to keep your body going.

Cells may be tiny, but without them, we'd be nothing.

- ✓ There are between 50 and 75 trillion cells in your body.
- ✓ Human red blood cells live for around 120 days.
- ✓ Stomach cells only last 2 days.
- ✓ The biggest single cell you might ever see is the ostrich egg.

Cell Types

Q: What is the basic unit of life?
A: the cell

There are 2 types of cells –

prokaryotic	VS	eukaryotic
• Unicellular (1 celled) • No nucleus • genetic material (DNA) in cytoplasm • No organelles Ex. bacteria		• Multicellular (many celled) • Nucleus • genetic material (DNA) in nucleus • organelles Ex. plants, animals, insects

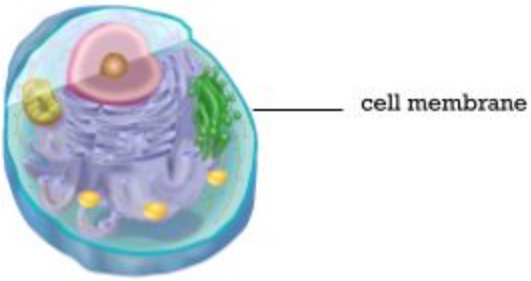
Did you know that cells contain smaller structures called **organelles**?

Q: What is an organelle?
A: a tiny structure that carries out a specific function within the cell

What is the MAIN difference between prokaryotic and eukaryotic cells?

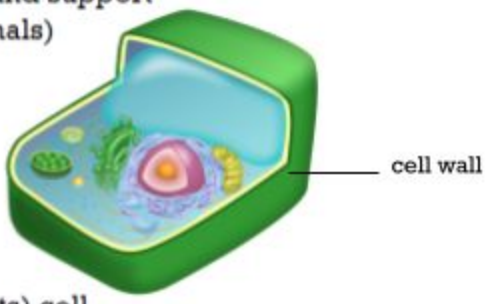
Where is the genetic material (DNA) found in a bacterial cell found? In an animal cell?

18 Cell Organelles (parts)



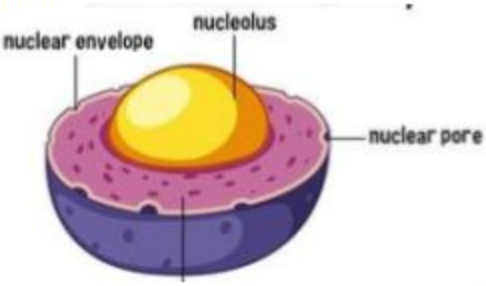
1. **cell membrane**

- flexible covering that encloses the cell for protection and support
- "passageway" for H_2O, oxygen, food and wastes (animals)
- made of proteins and lipids



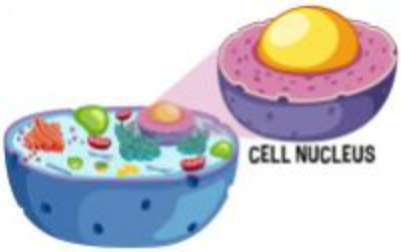
2. **cell wall**

- stiff structure
- protects and supports the plant (bacteria, fungi, protists) cell
- "passageway" for H_2O, oxygen and food (plants)



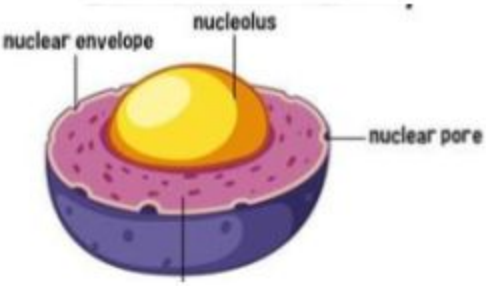
3. **nuclear membrane**

- 2 membranes that enclose the nucleus
- contains many openings called pores
- protects the nucleus



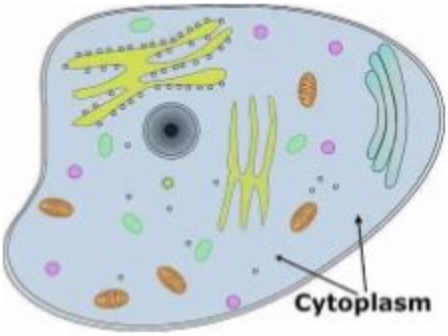
4. **nucleus**

- directs cell activities
- contains genetic information (chromatin stored on chromosomes that make up DNA)
- "the brain" of the cell



5. **nucleolus**

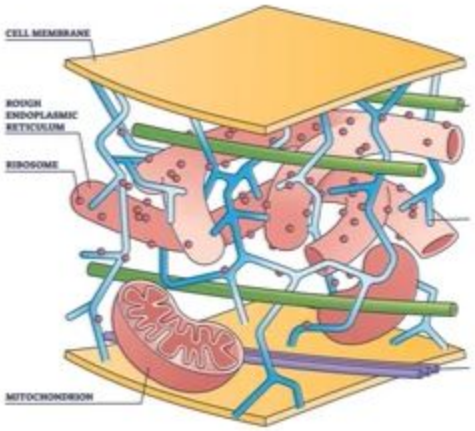
- found in the nucleus
- makes ribosomes (make proteins)



6. **cytoplasm**

- jellylike substance that protects the cell
- contains H_2O, salts and other molecules
- "the shock absorber"

7. **cytoskeleton**



- network of threadlike proteins joined together
- gives the cell its shape

8. **mitochondria**

- rod-shaped "powerhouses"
- make energy for the cell
- energy stored in ATP (adenosine triphosphate)
- ATP is the fuel for cellular processes - growth, cell division, and material transport
- found mainly in muscle cells

Q: In what types of cells would you expect to find a lot of mitochondria?
endoplasmic reticulum

9. **rough ER**

- found close to the nucleus
- site of protein production
- has ribosomes on its surface

10. **smooth ER**

- makes lipids such as cholesterol (good kind)
- helps remove harmful substances from the cell

11. **ribosomes**

- small circular structures on the rough ER
- make proteins

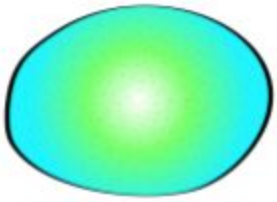
12. **golgi bodies**

- prepares proteins for specific jobs or functions in the cell
- packages proteins into vesicles

13. **vesicles**

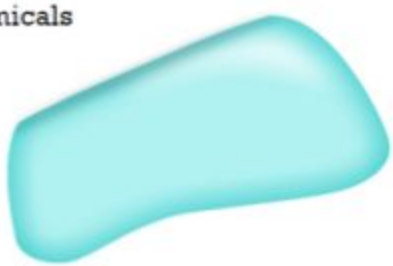
- tiny, membrane-bound, circular structures
- transport substances from one area to another in a cell

14. **lysosomes**



- destroy "bad guys" and some wastes with stored chemicals
- "the cleaning crew"

15. **vacuole**



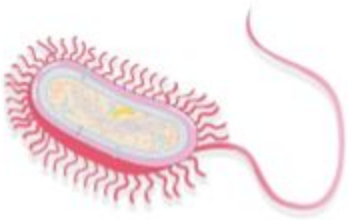
- stores waste, food, water
- plants contain one large, animals several small

16. **chloroplasts**

- capture light energy (sunlight) and use it to produce chlorophyll
- makes food (glucose) through photosynthesis $CO_2 + H_2O \rightarrow$ glucose (sugar) + O_2
- sunlight

Q: What types of cells contain chloroplasts?

17. **flagella**



- long, tail-like appendage
- whips back and forth and move a cell

18. **cilia**

- short, hair-like structures
- move a cell
- move molecules away from a cell

Ex. paramecium in H_2O or lining of your trachea (germs)

Classwork - Label the Cell Organelles