

Al- Mustaqbal University College

First stage.  
Department of Optometry(Optics)

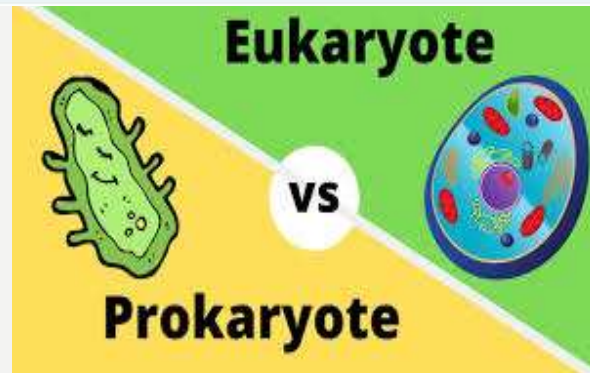


جامعة المستقبل الاهلي  
مرحلة الاولى  
قسم التقنيات البصرية

Lab : 2

Dr.Zainab waddah Naser

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## Prokaryotes vs. Eukaryotes

The vast diversity of living organisms can be grouped into two types of cells –Prokaryotes and Eukaryotes. Prokaryotes are bacteria and archaea. All other living organisms like plants, animals, fungi and protists are eukaryotes. All cells share certain features like a plasma membrane, cytosol and DNA. However, there are many differences between prokaryotes and eukaryotes. The primary identifiable difference between prokaryotes and eukaryotes are a membrane bound nucleus and membrane enclosed organelles. Prokaryotic cells have no nucleus or membrane bound organelles. Other differences include prokaryotes are single celled, most have a cell wall, and less complex DNA. Eukaryotes have a nucleus which contains chromosomes, can be single or multi-celled, and have more complex genomes

## **OBJECTIVE:**

- 1- IDENTIFY THE GENERAL SHAPES OF COMMON BACTERIA
- 2- DESCRIBE THE DIVERSITY OF PROKARYOTIC AND EUKARYOTIC MICROORGANISMS
- 3- MASTER THE USE OF THE LIGHT MICROSCOP

Using the microscope, examine the sample of pond water. Use the spaces below to sketch a few of the organisms you observe. You may also use the protists keys to help identify some of the organisms. When you are finished, rinse and clean your slide.

## BEFORE WE CAN MOVE FORWARD, YOU NEED TO KNOW...

- **All organisms (living things) are made of cells**
- Most of the organisms you are familiar with are **multicellular-made up of many cells.**
- However, some organisms can be **unicellular-made up of only one cell.** Its entire body is just one super tiny cell!

## CELLS FALL INTO ONE OF TWO CATEGORIES...

- Prokaryotes (prokaryotic)
- or
- Eukaryotes (eukaryotic)

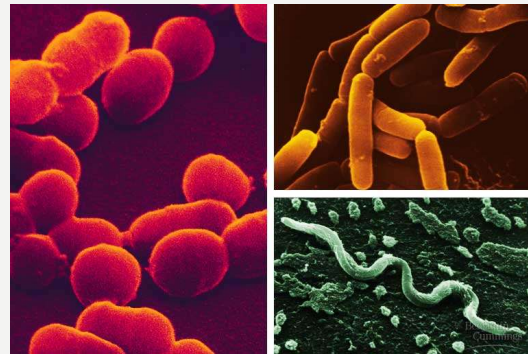
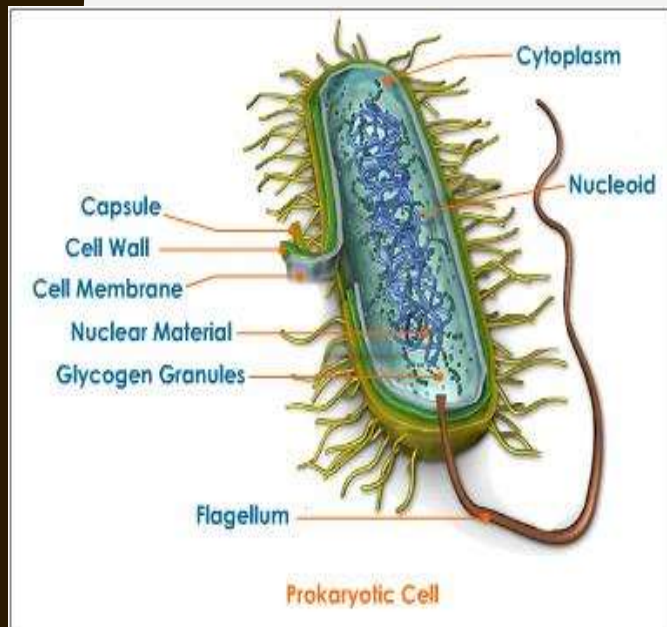
And that is it! Every organism on the planet can be put into one of these two categories, including you!

Pro means NO!

**PROKARYOTES:**

- unicellular microorganisms
- lack a distinct nucleus
- lack membrane-bound organelles
- always bacteria!!!
- very simple and small

## PROKARYOTES:

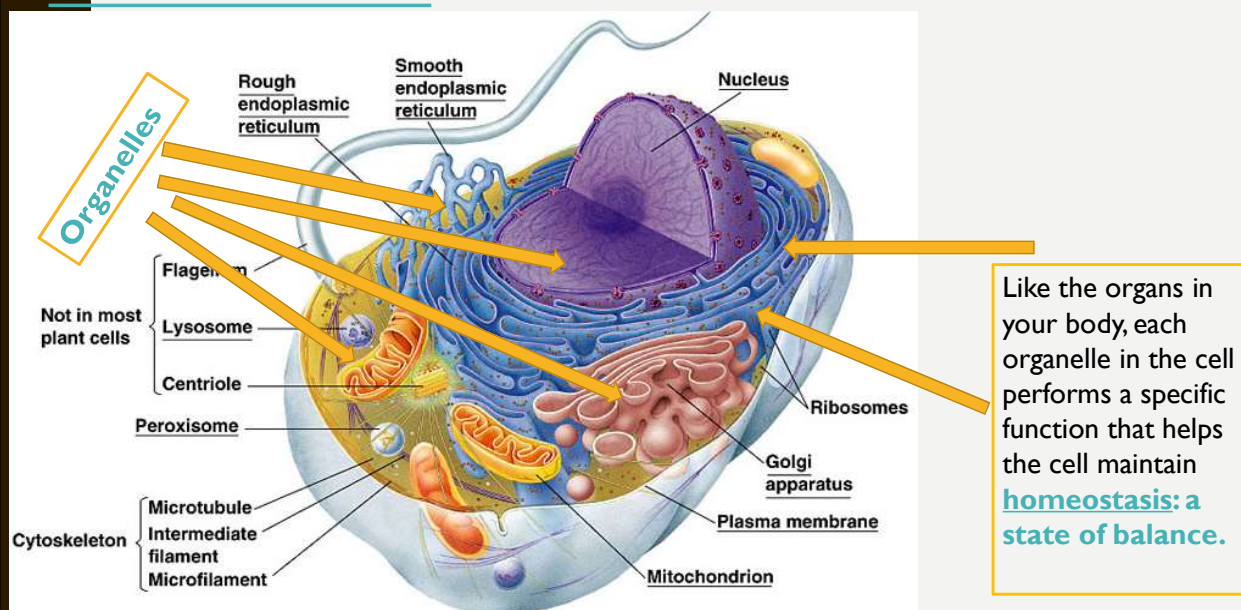


Eu means True

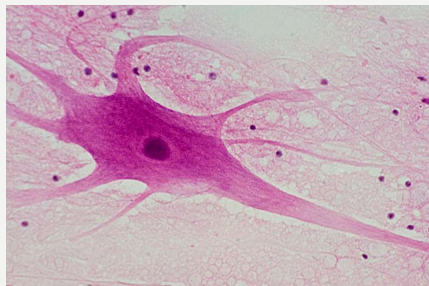
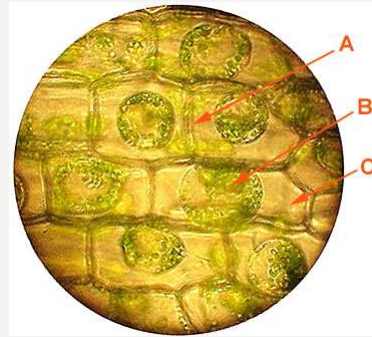
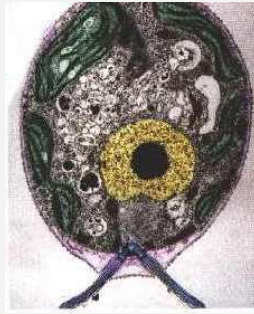
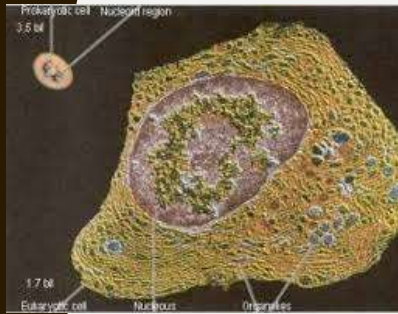
## EUKARYOTES:

- unicellular or multicellular organisms
- have a nucleus
- have membrane-bound organelles
- **LARGER** and more complex (have more stuff inside)
- Examples: animals, plants, fungi and protists
- **NEVER BACTERIA!!!!**

## EUKARYOTES:



# EUKARYOTES:

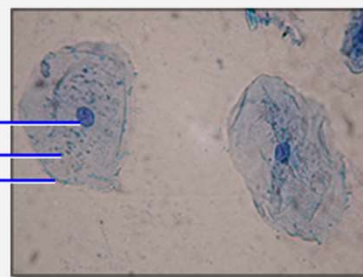


## Prokaryotes are much smaller than Eukaryotes

### Prokaryote (Bacteria)

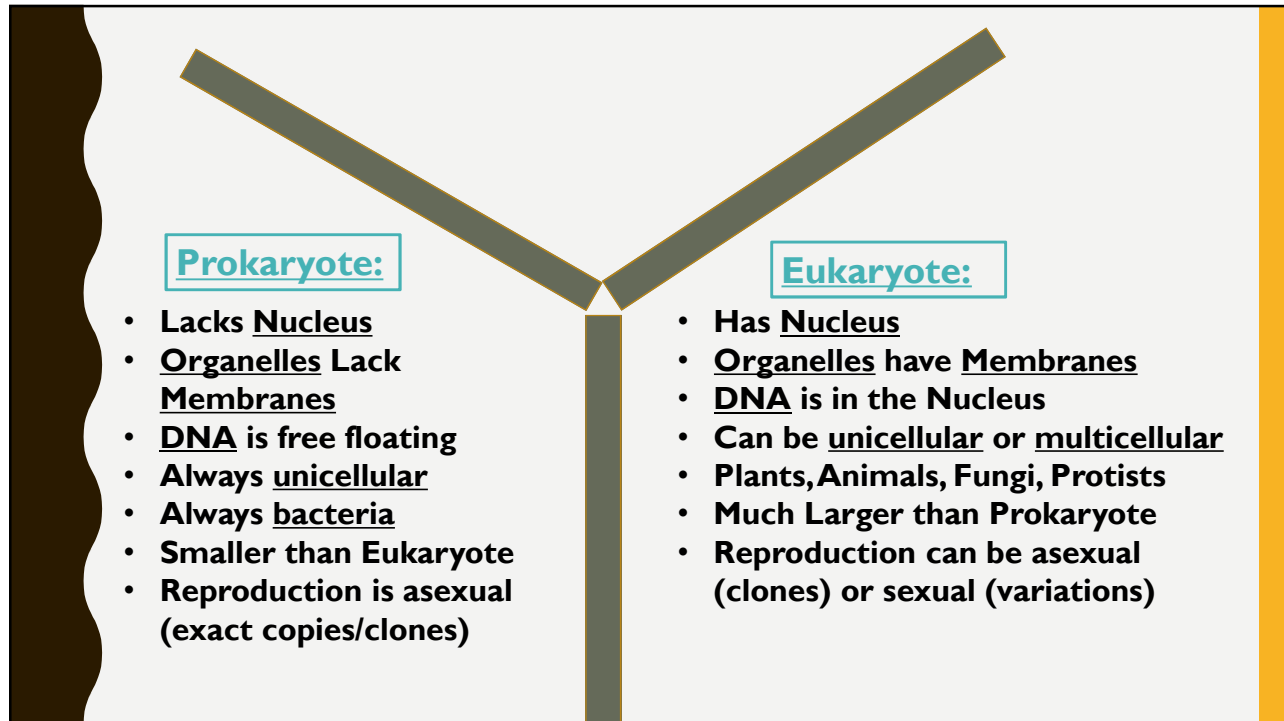


### Eukaryote (Animal Cell)



Bacterial cell  
Nucleus  
Cytoplasm  
Plasma membrane





## QUICK WRITE

How do prokaryotes differ from eukaryotes?